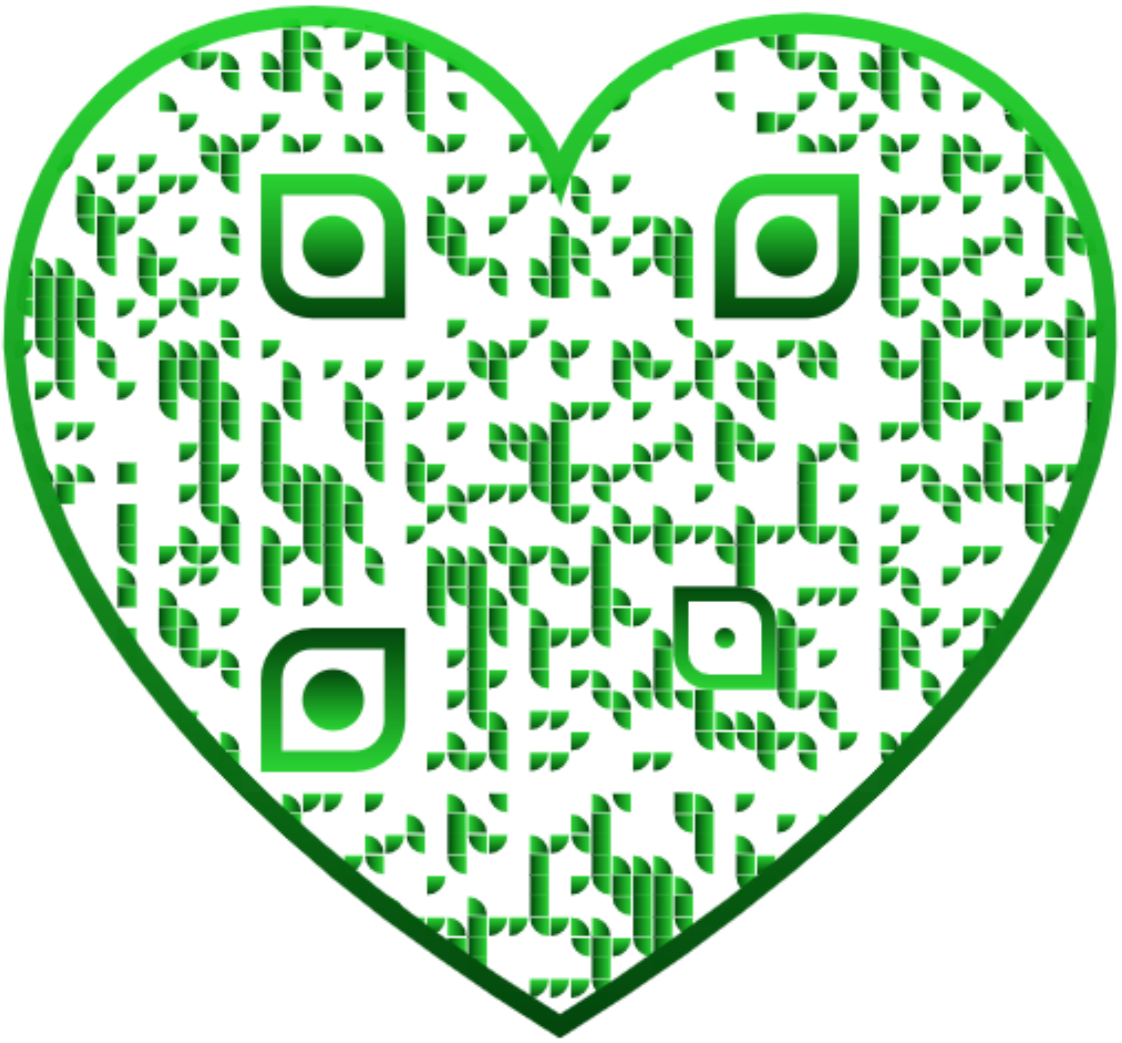
# SCIENCE, SUBJECTIVITY & WHO WE REALLY ARE



# MIND-BODY PROBLEMS
## Science, Subjectivity & Who We Really Are

A book by John Horgan, author of *The End of Science* and *Rational Mysticism*

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For My Students

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## Table of Contents

About Mind-Body Problems

INTRODUCTION
The Weirdness

CHAPTER ONE
The Neuroscientist: Beyond the Brain

CHAPTER TWO
The Cognitive Scientist: Strange Loops All the Way Down

CHAPTER THREE
The Child Psychologist: The Hedgehog in the Garden

CHAPTER FOUR
The Complexologist: Tragedy and Telepathy

CHAPTER FIVE
The Freudian Lawyer: The Meaning of Madness

CHAPTER SIX
The Philosopher: Bullet Proof

CHAPTER SEVEN
The Novelist: Gladsadness

CHAPTER EIGHT
The Evolutionary Biologist: He-Town

CHAPTER NINE
The Economist: A Pretty Good Utopia

WRAP-UP
So What?

# INTRODUCTION
## The Weirdness

In an ancient flash memory, I am walking near a river on a hot summer day. My left hand grips a fishing rod, my right a can of worms. One friend walks in front of me, another behind. We're headed to a spot on the river where we can catch perch, bullheads and large-mouth bass. Weeds bordering the path block my view of the river, but I can smell its dank breath and feel its chill on my skin. The seething of cicadas builds to a crescendo.

I stop short. I'm me, I say. My friends don't react, so I say, louder, I'm me. The friend before me glances over his shoulder and keeps walking, the friend behind pushes me. I resume walking, still thinking, I'm me, I'm me. I feel lonely, scared, exhilarated, bewildered.

The memory is like an old coin I've kept in my pocket since childhood, smoothed by decades of handling. I'm not sure how accurate it is. I've forgotten details, like who my companions were. They were probably Tim and Nancy, my best friends, but I can't be sure. If a mini-drone disguised as a dragonfly had been spying on us, I could check my memory against the video. But the drone couldn't read my mind, where the real action was.

Over the decades, this incident has become my personal creation myth, which goes as follows: Before that moment beside the river, I was whole, living entirely within myself. Then my mind split in two. One part of me was still seeing, hearing, smelling, walking. Another part was gawking at the first part and thinking, Huh? I became self-conscious, aware of myself as something weird, distinct from everything else in the world. I couldn't articulate any of this at the time. I'm projecting decades of rumination back onto my clueless five-year-old self. But that moment, that Huh?, was my first confrontation with the mind-body problem.

The phrase "mind-body problem" dates back only to the 19th century, but the problem is primordial. It springs from the bewilderment you feel when you unexpectedly come face to face with yourself. The loopy feedback-ness of the sensation amplifies it. Try to analyze it, put it into words, and you

might take note of your bizarre hybrid nature. You are a physical thing in a world of physical things, including other people. You have height, width, heft, you are subject to gravity and other forces, and yet you are not just physical. Others can see your body, but they cannot see your mind. You have perceptions, thoughts, feelings, including this feeling of estrangement.

The mind-body problem is often equated with the problem of consciousness, which philosopher David Chalmers calls "the hard problem. How does a brain, a mere lump of matter—"meat you can eat," as Douglas Hofstadter puts it—produce subjective experiences like those I have writing these words and you have reading them? When and why did consciousness evolve, and what creatures besides humans possess it? Most people accept that monkeys and dogs are sentient, but what about a trout or bedbug? Are brainless organisms like jellyfish or amoebas aware? Smart phones and other non-living things?

But consciousness is just one of many mind-body conundrums. Free will is another. Do our physical components—genes, ganglia, neurotransmitters, hormones—dictate what we do? Are conscious thoughts really afterthoughts, which give us the illusion of self-control but lack causal power? Does that mean that "mental illness" is a misnomer, that depression and schizophrenia are physical illnesses best treated with physical remedies?

Then there are questions related to morality and meaning. Where do compassion and empathy come from, and our sense of right and wrong, of fairness, of what ought to be? Can investigations of the biological basis of morality give us moral guidance? If we are nothing but matter—if there is no divine justice, no soul or afterlife, if when we die that's it—what is the point of being good? What, if anything, makes life worth living? What gives it meaning? The philosopher Owen Flanagan calls this the really hard problem.

And what is the self, this… thing that each of us possesses, that supposedly exercises free will, that agonizes over whether to undergo a sex-change operation, stop taking anti-psychotic medication, believe in God or telepathy? What makes me me, and you you? Could the Buddhists be right that the self is a mirage? Given all the metamorphoses we undergo as we age, is it absurd to believe in something enduring at our core? Can I really be the same person as that boy pushing through weeds and bleating, "I'm me"?

Schopenhauer, that German grouch, called the mind-body problem the "world knot," but he could have said knots. The more you stare at the

mind-body problem, the more problems you see, knots within knots within knots. It is the deepest of all mysteries, the one toward which all other mysteries converge. I once thought the origin of the universe is the biggest mystery, why there is something rather than nothing. But without mind there might as well be nothing.

Few people outside philosophy and mind-related fields are familiar with the phrase “mind-body problem,” with good reason. Experts make the problem seem dauntingly arcane and remote from everyday concerns. Some insist it is a pseudo-problem, which vanishes once you jettison archaic concepts like “the self” and “free will.” Actually, the mind-body problem is quite real, simple and urgent. We face it whenever we wonder who we really are, can be and should be.

Every field of science, from physics to economics, touches on this question, at least implicitly. So do philosophy and other humanities, as well as poems, novels, paintings, films, all the arts. Historically most of us have relied on religion for answers. I was raised Catholic, and as a boy I believed that I have an immortal soul, and if I’m good in this life, I’ll be rewarded in the next. After I confessed my sins to a priest, my soul glowed within me, white and pure. I was smugly confident that if a bus ran me over, God would whisk me up to paradise to live forever with Him, Jesus and Mary.

By my teens, Catholicism had stopped making sense. Like others in my generation, I read books like The Doors of Perception, Be Here Now and Siddhartha, and I became entranced by the mystical doctrines of Hinduism and Buddhism. The concept of enlightenment was especially alluring. It’s like heaven, except you don’t have to die to go there. I twisted myself into yogic knots, chanted mantras and ingested tiny orange barrels and squares of blotting paper. Far from enlightening me, these practices compounded my confusion.

I became a science journalist after deciding that science represents our best hope for telling us who we really are. My timing was fortuitous. In the late 1980s, when I joined the staff of Scientific American, scientists seemed poised to solve the mind-body problem once and for all. They were tracing consciousness, emotions and other mental functions to the chatter of brain cells, the ebbs and flows of hormones and neurotransmitters, the switching on and off of genes.

Leading this assault on the mind-body problem was Francis Crick,

legendary cracker of the genetic code. He spelled out the implications of his perspective with brutal clarity in his 1994 book The Astonishing Hypothesis: "'You,' your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll's Alice might have phrased it: 'You're nothing but a pack of neurons.'" The book's subtitle, The Scientific Search for the Soul, was ironic. Crick, an atheist, wanted to eradicate belief in souls. And note the scare quotes around "You."

Crick's neuro-reductionism, while dispiriting, clearly represented our best hope for self-knowledge, and for solving practical mind-body problems like mental illness. So I thought. I expected Crick's approach to crush its competition and give mind-science the unifying paradigm it desperately needed. Science would grind mind down to purely physical processes, just as it had done with photosynthesis, heredity and other biological puzzles.

That hasn't happened. I have been tracking mind-science for decades now, and it has never been more fractious. Far from converging on a common approach to the mind-body problem, experts cannot even agree on how to talk about it. Should they adopt the jargon of neuroscience? Physics? Computer science? Evolutionary biology? Psychology? Philosophy? All the above? None of the above? Some hard-core materialists insist the mind-body problem has already been solved. Sure, we have details to work out, but we really are nothing but a pack of neurons.

Other theorists are proposing models based on quantum mechanics, information theory and Bayes theorem, a centuries-old formula for calculating probabilities. Heretics question the assumption that matter is the primary stuff of reality. They speculate that consciousness is as fundamental as matter, or more fundamental. Theorists are dredging up conjectures of Descartes, Spinoza and even Buddha, a quasi-mythological figure who lived 2,500 years ago. That's like particle physicists reviving the ancient Greek claim that everything is made of earth, water, air and fire. "Paradigm shift" doesn't describe what's happening in mind-science. It is a paradigm explosion.

Nothing has surprised me more than the change of mind—the swerve—of Crick's long-time collaborator Christof Koch. When he and Crick began co-writing articles on the neural approach to consciousness, Koch was in his

early 30s. He became a world-famous scientist in his own right, an authority on the mind-body problem. In 2011 he took over a major brain institute in Seattle.

By then Koch was touting an ambitious new explanation of consciousness, integrated information theory, which he called "a gigantic step in the final resolution of the ancient mind-body problem." The theory holds that consciousness lurks within any system, not just brains, with parts that interact in complex ways. A bacterium, integrated circuit, even a single proton. Koch described the theory as "a scientific version of panpsychism, the ancient and widespread belief that all matter, all things, animate or not, are conscious to some extent."

My reaction was, Huh? Integrated information theory struck me as preposterous, and a repudiation of the practical, no-nonsense approach Koch and Crick had stood for. I suspected that Koch, whom I had interviewed many times, had gone off the deep end. When I heard he had passed through a mid-life crisis, during which his marriage collapsed, I thought, Aha! That explained his swerve. Emotional factors had warped his scientific judgment.

But my respect for Koch gave me pause. Maybe my judgment was warped. After all, I was stubbornly committed to the idea that the era of profound discoveries has ended. My hyper-skepticism could be blinding me to the merits of integrated information theory and panpsychism. And who was I to tell Christof Koch how to see the mind-body problem? That's like telling him who he really is.

Then I thought, Hold on, there's a paradox here. Science is a method for eliminating subjectivity from our perceptions so we see things as they really are, we achieve objectivity, which philosopher Thomas Nagel calls "the view from nowhere." But the mind-body problem is different from other scientific problems, because subjectivity is part of the problem. Subjectivity, you might say, is the problem. Maybe we cannot escape our subjectivity when we contemplate consciousness and other mind-related riddles. When it comes to the mind-body problem, maybe there is no view from nowhere.

Wait, would that mean anything goes? People can answer mind-related puzzles in any way they choose? They can believe whatever they like about themselves, and about humanity in general? Objective investigation of the mind-body problem is pointless? That can't be right. At some point during this internal panel discussion, my view of the mind-body problem

shifted, and I came up with an idea for a book. I called Koch in Seattle, and I said something along these lines:

I'm thinking of writing a book about the mind-body problem, and I'm thinking of calling it Mind-Body Problems, with an "s," because there are lots of mind-body problems, like consciousness, free will, and the self, and also we all wrestle with our own private versions of the mind-body problem, because we all have different minds and bodies and lives and outlooks, different fears and desires, so maybe we should accept that there isn't one correct answer to the mind-body problem, we all have to find our own answers, and I want to explore this idea by telling the stories of people who have struggled, really struggled, with the mind-body problem in their professional and personal lives, people like a neuroscientist who went through a mid-life crisis…

Yeah, yeah, Koch said as I wrapped up my spiel. He got the idea, and he was ready to talk, on the record, about how his troubles might have affected his scientific views. If Koch had scoffed at my pitch, and declined to tell me about his personal life, I probably would not have written this book. Instead, he foolishly suggested dates when I could visit him in Seattle, and he recommended other experts for me to interview. If my life-long, anxious self-awareness is the ultimate cause of this book, Koch's swerve is the proximate cause. Thanks a lot, Christof.

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"No ideas but in things," William Carlos Williams proclaims in his epic poem Paterson, violating the precept in stating it. My conceit is no ideas but in people. If there is no totally objective, third-person view of the mind-body problem, then there are only first-person views, and the best way to see the mind-body problem is to look at it from lots of different mindsets.

Each of the following nine chapters peers at the mind-body problem through the eyes of a different expert. Five are men and four women, one of whom used to be a man. They come at the mind-body problem from distinct intellectual perspectives. Neuroscience, mathematics, physics, child psychology, evolutionary biology, philosophy, economics. One is a law

professor trained in psychoanalysis, another a novelist who called her first work of fiction The Mind-Body Problem.

For these men and women, the mind-body problem is not just an intellectual puzzle. They have skin in the game. When I mentioned this criterion to the transgender economist Deirdre McCloskey, she chortled and said, “I have skin in the game all right.” She and the other eight subjects of this book have endured the suicide of a child, schizophrenia, bipolar disorder, a brain tumor, sexual confusion, the loss of religious faith. They have struggled to understand themselves, to be good, to be happy, to live meaningful lives, to matter. That could be a definition of humanity: matter that yearns to matter.

I’ll show how my subjects’ intellectual judgments, their convictions about what is true, are entangled with their fears and desires, their feelings about themselves and the world, about life and death, about what is good and beautiful and meaningful, about what really matters. In other books, I’ve dwelled on subjects’ personalities in ways that undermine their credibility. Here I’m ad hominem and ad feminam in the service of empathy and understanding.

I’ll try to be honest about my own feeling and foibles, too. This book presents my subjective views of my subjects’ subjective views of subjectivity. It’s subjectivity all the way down. Have I abandoned all hope of objectivity? Not at all. At heart I’m still a straight-laced, fuddy-duddy science journalist who believes, knows, that science can discover true facts about the world. But my view of truth has become more expansive lately.

Since 2005 I’ve taught at Stevens Institute of Technology, an engineering school in New Jersey. One perk of the job, until he retired recently, has been seeing my pal James McClellan, a historian of science with magnificent, Moses-esque hair and beard, rushing to class, black academic gown billowing behind him.

Another perk, which endures, is arguing with Jim about truth. He is an honest-to-god postmodernist, who studied under Thomas Kuhn in the 1970s and was permanently infected by his skeptical outlook. Jim denies that science discovers absolute, objective, permanent truth. He drives me nuts by insisting that natural selection, the genetic code, the atomic theory of matter and the big bang aren’t “discoveries,” and they aren’t “true.” They are inventions, or “stories,” which reflect our culture’s values, and will inevitably

yield to different stories.

Jim accuses me of being a “naïve realist,” because I believe that our scientific stories reflect reality, how things are. He once demanded that I give him an example of an absolute, permanent scientific truth. The earth is round, I replied, not flat. The earth isn’t round, Jim cried, it’s an oblate spheroid! Okay, I said, then that is the absolute truth. After that conversation, whenever Jim spouted his Kuhnian nonsense, I’d mutter, Oblate spheroid, oblate spheroid.

I have grudgingly come to accept that Jim is right in one very important way. When it comes to the mind-body problem, the deepest of all mysteries, we should look at our suppositions as stories. All stories, even those with omniscient narrators, have a point of view. This isn’t as anything-goes as it sounds. As Jim (like Kuhn) emphasizes, some stories are more persuasive than others. They explain observations better, and yield more impressive applications.

Jim’s view resembles that of our engineering colleagues. Faced with a problem like building a bridge across the Hudson, engineers don’t seek the “true” solution. That would be a misuse of language, or what philosophers call a category error. Engineers seek a solution that works, that solves the problem at hand.

Mind-body stories can work in many ways, from the practical to the spiritual. They can lead to more accurate models of neural activity, to more effective tests and treatments for bipolar disorder and schizophrenia, to brain implants that can monitor and manipulate thoughts, to better methods for raising and educating kids, to more peaceful, prosperous societies. These are outcomes that can be objectively assessed.

Mind-body stories can also help us overcome despair or rage, give us moral guidance when our marriages are wobbling, console us if our child takes her life. They can satisfy our longing for meaning and beauty, help us make sense of our lives and feel less estranged from the world. These outcomes are more personal and hence harder to evaluate from the outside. They are matters of taste as much as truth.

My subjects have found mind-body stories that work for them. We are illusions created by self-perpetuating “strange loops” in our brains. Quantum wave functions communing spookily with other functions. Egos trying desperately to keep a lid on our ids. I’ll do my best to judge these mind-body

stories objectively, to tell you how well they work, while acknowledging that a mind-body story that works for you might not work for me. In fact, a mind-body story that works for me today might not work for me tomorrow.

To be human means to undergo a perpetual identity crisis, to be a work in progress. We do not discover ourselves in the same way that we discover other features of nature, like pulsars and x-ray, or even components of our bodies, like synapses and genes. We invent ourselves, imagine ourselves, and we keep shape-shifting, swerving, throughout our lives. Our ideas about ourselves and others can change dramatically when we fall in love, have children, get divorced, get locked up in a psychiatric ward, have a sex-change operation and fall in love again, miraculously, after resigning ourselves to solitude.

Also, human history is one long identity crisis. Science and other realms of culture keep expanding the range of possible answers to the mind-body problem. Inventions as diverse as meditation, Islam, capitalism, Marxism, eugenics, stream-of-consciousness fiction, psychoanalysis, quantum mechanics, computers, genetic tests, MRIs, queer theory, civil-rights legislation, brain implants and LSD have given us new ways in which to conceive of ourselves.

We should take stock of our protean nature when we consider what we are, can be and should be as a species. Yes, I'm talking about the destiny of humanity. When we peer into the future and imagine ourselves a decade, century or millennium from now, that, too, is a mind-body mystery, maybe the most consequential of all. Will our identity crisis ever end? Will we ever converge on a single answer to the mind-body problem? I hope not.

When I said, earlier, that my nine experts have "skin in the game," I meant that they have earned the right to choose mind-body stories that work for them. This book's premise is that all of us, experts and non-experts alike, have that same right, because we are all suffering, mortal creatures. We all have skin in the game. And as long as we are individuals, with different minds and bodies and lives, we will always choose different mind-body stories, unless our species has swerved down a very dark path.

A friend in the publishing racket urged me to give this book a more self-help-y theme and title, like The Mind-Body Solution. I should emphasize the inspiring aspects of my subjects' life stories and offer advice on discovering your true self, something along those lines. I'm not against uplift,

and I do find my subjects' stories inspiring. Toward the end of this book I'll offer thoughts on how we can create a more peaceful world, in which we all have a pretty good shot at happiness.

But if self-help books offer certainty and assurance, this is the opposite of a self-help book. For most of my life, I have assumed that there is a way to look at myself and others that would dispel my feeling of weirdness. Now I've come to accept that the weirdness isn't just in my head, it's out there.

To see ourselves clearly is to see ourselves as wildly improbable and inexplicable. My goal is to get you to be as mystified by the mind-body problem as I am. Because, to answer a question I posed earlier, I am still the same person as that five-year-old boy pushing through weeds and thinking, Huh?

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My students, to whom this book is dedicated, serve as my sounding board and more. They inspire me, they make me feel better about the future. Most are engineering and computer science majors, and many take humanities courses only because they must. They can be a tough audience, but I like that, I see it as a challenge.

I have tried various tricks to get them to appreciate the mind-body problem. Recently I assigned everyone in my science-writing seminar a different mind-body expert. Each student had four or five minutes to tell classmates about his or her expert. Don't just recite the accomplishments, I said, tell a story about this person.

The presentations often surprise me, because the students don't see Koch and Hofstadter and McCloskey as I do. When they were done, I asked them to guess why I gave them this assignment. Blank faces, shrugs. These experts have something in common, I said. What is it? Someone replied, They seem pretty different from each other, and others nodded. Yeah, they are pretty different, I said, but most of them are in a book I'm writing, and all of them could be in it. Can you guess what the book is about? More shrugs, stares.

Imagine these experts, I said, standing in a circle, facing inward. They are staring at this mysterious thing in the middle of the circle, trying to figure it out. Each expert describes the thing in a different way, with physics, neuroscience, psychology, biology, philosophy, economics, even literature. But it's the same thing, the same mystery, there in the middle. What is it? There were only a couple of minutes left in the class, and a few students were reaching stealthily for their backpacks. Humanity? a brave soul finally ventured. Yes! I said, and added,

The mystery is you, and it's me, it's all of us, it's every person who ever lived, and who ever will live. It's the mystery of human existence, which is the oldest and deepest mystery. What are we, really? What can we be? What should we be? Are we meat? Bags of quarks and electrons? Genes and neurotransmitters? Software programs? Children of God? Cogs in the industrial machine? This mystery is sometimes called the mind-body problem. Some of you may think you already know who we are, or you may think there are experts out there who do. But I want you to consider the possibility that there isn't one answer to that question, there are lots of answers, maybe even an infinite number of answers, as many answers as there are people, because we're all different, not in trivial ways but in ways that matter, and also humanity keeps changing, we keep creating new ways to see ourselves, and be ourselves, you have more choices than I did when I was a kid, and some of you might invent things like AI programs or brain implants or gene therapies that give us more options, more ways to be human, more answers to the mind-body problem, and that's never going to end, at least I hope it never ends. Anyway that's what my book is about. I have a few loose ends to tie up, but I'm almost finished with it. I call it Mind-Body Problems. With an "s."

My students were rising from their chairs now, cramming notebooks into backpacks, checking smart phones, chatting with each other. Some, perhaps amused by my rant, were smirking. A few were frowning. They looked distracted, even bewildered, as if brooding over a dilemma for which they can see no solution. Yeah, I thought, I'm getting through to them.

Chapter One

# The Neuroscientist: Beyond the Brain

I like students to see canonical thinkers as real people, not word-spouting statues. So when I talk about Socrates, I call him a pompous blowhard, to humanize him—and because he was a pompous blowhard. At his trial, defending himself against charges of heresy, Socrates disparages various big shots, including his accusers, for being too dumb to know how dumb they are. Only he, Socrates, is truly wise, because he knows how little he knows, and that makes him a better man than his critics.

I understand why this know-nothing/know-it-all irked his fellow Athenians. But his view of wisdom is, well, wise, and so is his framing of the mind-body problem. Socrates brought it up after his trial, when he was in his prison cell awaiting execution. He was complaining to his acolytes about philosophers who explain everything in terms of physical "eccentricities" such as "air, and ether, and water."

How, Socrates asked, would such a philosopher account for what he is doing in this cell? The philosopher might point out that he, Socrates, "is made up of bones and muscles… and as the bones are lifted at their joints by the contraction or relaxation of the muscles, I am able to bend my limbs, and this is why I am sitting here in a curved posture." But that would be a crappy explanation, Socrates pointed out, because the "true cause" of his situation "is that the Athenians have thought fit to condemn me, and accordingly I have thought it better and more right to remain here and undergo my sentence."

Socrates continued: "It may be said, indeed, that without bones and muscles and the other parts of the body I cannot execute my purposes. But to say that I do as I do because of them, and that this is the way in which mind acts, and not from the choice of the best, is a very careless and idle mode of speaking."

There it is, Socrates zeroing in on the mind-body problem 2,400 years ago. Yes, we're bodies subject to physical forces. But we also have minds, which are motivated by causes—like our sense of right and wrong, of "the best"—that cannot be reduced to physiology. Viewing ourselves as nothing

but bodies leads to what Socrates called “a strange confusion of causes and conditions.”

Philosophers have been wrestling with the mind-body problem for millennia now. In honor of Socrates, let’s call this period “The Era of Strange Confusion.” Not only have philosophers failed to converge on a solution, they have buried the mind-body problem under a mishmash of isms. Here are the most popular:

Materialism: Matter is at the bottom of everything.

Idealism: Mind is at the bottom of everything. (Idealism is confusing, because of its alternate meaning, but philosophers, I suspect, like confusing us lay folk.)

Dualism: Mind and matter are both really important, and they are linked by a trans-dimensional quantum wormhole embedded within the pineal gland. Or something. Dualists still aren’t sure about that part.

In 1990 the Era of Strange Confusion seemed to be ending, with materialism prevailing once and for all. That was the year in which Francis Crick and his sidekick Christof Koch issued their manifesto “Toward a Neurobiological Theory of Consciousness.” They announced that “the time is now ripe for an attack” on consciousness, the core of the mind-body problem. Science could “solve” consciousness by finding its “neural correlates,” that is, processes in the brain corresponding to conscious states.

Crick and Koch identified a possible candidate for a neural explanation of consciousness. Experiments on cats and other animals indicated that when the brain focuses on a visual stimulus, like a red ball, neurons corresponding to that stimulus fire at roughly the same rate, 40 times a second, in synchrony. These 40-hertz oscillations could play a key role in consciousness, Crick and Koch proposed. They could have been telling Socrates,

You were right to mock physiological explanations of the mind. In your day, you didn’t have a clue about the connections between physiological and mental processes. You didn't even know that the mind is based in the brain! Today, we know much more about our physiologies than you did. We can explain a lot with neuroscience, biochemistry, evolutionary theory and genetics.

Koch became a leader of the effort to explain consciousness in neurobiological terms. You might even say he embodies the failure of that

effort, and I mean that as a compliment. He is always at the center of things. That's one reason why I've interviewed him so often over the decades. Another is that I never felt like he was patronizing or bullshitting me.

Are Koch and I friends? That's hard to say. I like him, he seems to like me. But as Koch likes pointing out, no one really knows what's going on in someone else's head. I can't even be sure that Koch is conscious, nor he me. It's the old solipsism problem. For all I know, I am the only conscious entity in the cosmos. I am sealed within the prison of my subjectivity, and I can only speculate about what, if anything, is going on inside your head.

Moreover, when I'm with friends, I don't ordinarily keep a notebook and recorder on hand. When Koch and I meet, we do so as professionals. I am a science journalist, he an expert on the mind-body problem. I am a means to his end, getting publicity for his work, he a means to mine, producing a piece of journalism—a story—for which I am compensated. As Robert Trivers (the subject of Chapter Eight) points out, even the most intimate relationships are ultimately tit-for-tat exchanges. Trouble arises when one side thinks he's not getting enough tat for his tit.

Koch has always given me what I need. First, he is a character, a tall, lean, hyperkinetic fast talker who favors brightly colored clothes and footwear and has tinted his hair orange and other hues. The son of a German diplomat, he speaks with a German accent, even though he has lived in the U.S. since the late 1980s. His right shoulder sports a tattoo of a rainbow-striped apple, the computer company's logo.

Koch churns out quips, insights, anecdotes, and he deftly explains even the most esoteric concepts. He reads voraciously in philosophy, history and literature as well as science, so he can flesh out the historical and cultural context of ideas. He mentions T.S. Eliot or Nietzsche not to show off but to drive home a point or crack a joke.

My "Koch" file is packed with my scrawled notes on our conversations. The oldest, on lined, yellow paper, record a telephone chat on December 28, 1992, when I was a full-time writer for Scientific American. We were talking about the limits of science, a topic to which we would return often. Koch told me to check out Thomas Mann's unfinished novel Confessions of Felix Krull, Confidence Man. A character in the book says there are three great mysteries: the creation of matter, life and consciousness. I never read Felix Krull, but my first book, The End of Science, argued that

science will probably never explain the origin of the universe, life and consciousness. Thanks for that, Christof.

I met Koch in the flesh in 1994 at “Toward a Science of Consciousness,” the first of what became biennial gatherings in Tucson, Arizona. Hundreds of scientists and philosophers from all over the world presented a dizzying array of “solutions” to the mind-body problem, from chaos theory to Hindu metaphysics. Quantum theories of consciousness were especially popular. One speaker described consciousness as “quantum fluctuations of the vacuum energy of the universe,” which “is really God.”

Koch served as a one-man reality check. In a keynote lecture, he deplored the flaky pseudo-science, often derided as woo, on display elsewhere in Tucson.

He derided quantum-consciousness models, arguing that they were based on a bogus syllogism: Quantum mechanics is mysterious, so is consciousness, therefore they must be related. And speculation about whether bacteria or computers or even the whole cosmos are conscious can never be confirmed and should be reserved for “late-night conversations over beer.” To understand consciousness, we must study brains, the only kinds of matter that we know are conscious. We should also focus on visual consciousness, because so much is already known about vision in humans and other animals.

Consciousness, Koch pointed out, is not exactly the same as perception. To demonstrate this point, he projected an image that can be viewed as either a vase or two human profiles. Although the visual input to the brain remains constant, the pattern that you are conscious of, or paying attention to, keeps shifting back and forth: vase, profiles, vase, profiles. Pinpointing neural operations underlying these shifts in attention, such as 40-hertz oscillations, would represent an important step toward solving consciousness.

Once we find the neural correlates of visual consciousness, Koch said, we might have a shot at more complex forms of consciousness, like self-consciousness. We might even take on riddles like free will. But Koch warned that science might never solve all mind-body mysteries to everyone's satisfaction. He quoted "philosopher" Dirty Harry, the tough movie cop played by Clint Eastwood: "A man's got to know his limitations." The crowd laughed and clapped, as did I.

Another high point of the meeting was Koch's run-in with David Chalmers, an Australian philosopher with long, lovely tresses. Chalmers was insisting that conventional, materialist approaches to consciousness, like the one advocated by Koch and Crick, are doomed to fail. They cannot explain why cognitive functions, such as attention, are accompanied by subjective experiences. They cannot account for the "felt quality of redness," the sound of a clarinet, smell of mothballs, agony of depression, ecstasy of orgasm. This is the "hard problem of consciousness."

Chalmers suggested a radical new perspective involving information theory, invented in the 1940s to quantify the capacity of telephone lines and other communication systems. Chalmers proposed that information, along

with matter and energy, is a fundamental property of reality, and it has two aspects, one objective, or physical, and one subjective, or experiential. Things containing lots of information, like brains, are very conscious, and things with just a little information, like thermostats—Chalmers actually used this example—are slightly conscious.

I thought, Conscious thermostats? Come on. Also, the concept of information is meaningless in the absence of a mind to be informed. Information-based theories of consciousness are circular. They explain consciousness with a concept that presupposes consciousness. This was just the kind of woo Koch had denounced. I was thus delighted when Koch confronted Chalmers at a cocktail reception and denounced his information hypothesis as untestable and hence pointless. “Why don’t you just say that when you have a brain the Holy Ghost comes down and makes you conscious?” Koch exclaimed.

Chalmers is a cool cat. The Holy Ghost hypothesis, he responded drily, is unnecessarily complicated, and it does not accord with his own subjective experience. “But how do I know that your subjective experience is the same as mine?” Koch retorted. “How do I even know you're conscious?” Yes! I thought, scribbling furiously in my notebook, good stuff, definitely going in my Scientific American article. Koch was bringing up the bugaboo of consciousness research, the solipsism problem. I can’t be sure you are conscious, let alone a thermostat.

After that 1994 meeting Koch kept updating me on consciousness research—and reminding me of its limits.

He pointed out weaknesses in all neural theories, including the 40-hertz oscillation model proposed by him and Crick. He warned that if we find a robust neural theory of human consciousness, we will probably keep arguing over whether fish or machines are conscious. We won’t know how consciousness evolved here on Earth, or whether it has arisen beyond our planet.

Koch taught me an especially invaluable lesson about the limits of knowledge in 1998 while I was visiting him at Caltech. As we entered his office he asked, too nonchalantly, Are you good at tests? Not bad, I said. He tapped the keyboard of his computer, and it displayed a frozen video shot of six men and women standing in a circle. Three were dressed in white, three in black. A person in white held one basketball, a person in black held another.

Koch told me to count the number of times the white team passed the basketball back and forth. Could I do that? Sure, I said.

Koch started the video, and I watched the white players toss the ball back and forth. I had to concentrate, because the black team was passing its basketball, too, and all the players, black and white, milled around. But when the video ended, I knew I had the answer. Fifteen! I said triumphantly. Koch smirked. That's good, he said, but did you see gorilla? Huh? I responded. Watch again, Koch said, and replayed the video. As the men and women passed the basketball back and forth, a man in a gorilla suit strolled into their midst, paused to face the camera for a moment and strolled off camera.

I was flabbergasted. How had I missed the gorilla? My dismay delighted Koch. Two psychologists designed the video, he said, to expose a feature of consciousness that is also a bug. Consciousness is highly selective. We are always conscious of something. We pay attention to that thing and filter out unrelated perceptions, thoughts and memories triggered by neural activity. I'm still haunted by that now-famous video. It implies that no matter how much we know, or think we know, we always miss something. Right now, an invisible gorilla could be standing in front of me, sticking his tongue out, waggling his hands, sneering.

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In his 2004 book The Quest for Consciousness, Koch reiterated his commitment to the neural-correlates paradigm, while acknowledging that consciousness remains as mysterious "as when humans first started to wonder about their minds several millennia ago." It was because of this intellectual modesty that I trusted his scientific judgment. He combined ambition with a hardheaded realism, a sense of science's limits. He was a shining beacon in the shadow realm of consciousness studies, a voice of reason in a cacophonous madhouse, an anti-woo warrior. That's why I felt baffled, even betrayed, when Koch embraced integrated information theory. It seemed like a big step backward into strange confusion.

Koch didn't invent integrated information theory. His friend Giulio Tononi did, in the early 2000s, and Koch soon embraced it. The theory

resembles the information-based hypothesis that Chalmers floated back in 1994, except it is far more detailed and ambitious. According to integrated information theory, a system is conscious if it possesses Φ, or phi, a measure of the system's "integrated information." Phi corresponds to the exchange of information between different parts of a system. Phi is often equated to "synergy," the degree to which a system is more than the sum of its parts.

The theory's technical details are hideously abstract and complicated, but they are less important than the theory's startling implications, which Koch spelled out in a 2009 article for Scientific American. A "single hydrogen ion, a proton made up of three quarks, will have a tiny amount of synergy, or Φ," Koch writes. So consciousness is a property not only of brains but of all matter. It pervades the entire universe. Integrated information theory represents the kind of metaphysical speculation that Koch once denounced, and yet in 2010 he told The New York Times that it is "the only really promising fundamental theory of consciousness."

Seeking illumination, in the fall of 2015 I wormed my way into a two-day workshop on integrated information theory at New York University. It was organized by Tononi, the theory's inventor, Koch and Chalmers. They and 10 other speakers presented their views, which were batted around by 30 or so other scientists and philosophers.

Tononi kicked off the workshop with a 90-minute tutorial on integrated information theory, followed by another hour from Koch. Their presentations paralleled an overview they published jointly in 2015, "Consciousness: here, there and everywhere?" Although the paper has whimsical touches (the title echoes an old Beatles song), this excerpt conveys its forbidding density:

"…the central identity of IIT can be formulated quite simply: an experience is identical to a conceptual structure that is maximally irreducible intrinsically. More precisely, a conceptual structure completely specifies both the quantity and the quality of experience: how much the system exists—the quantity or level of consciousness—is measured by its Φmax value—the intrinsic irreducibility of the conceptual structure; which way it exists—the quality or content of consciousness—is specified by the shape of the conceptual structure. If a system has Φmax = 0, meaning that its cause–effect power is completely reducible to that of its parts, it cannot lay claim to existing. If Φmax > 0, the system cannot be reduced to its parts, so it exists in

and of itself. More generally, the larger Φmax, the more a system can lay claim to existing in a fuller sense than systems with lower Φmax. According to IIT, the quantity and quality of an experience are an intrinsic, fundamental property of a complex of mechanisms in a state—the property of informing or shaping the space of possibilities (past and future states) in a particular way, just as it is considered to be intrinsic to a mass to bend space–time around it."

I love the "quite simply" in that opening sentence. In his presentation, Koch focused on empirical evidence for the theory. For example, the cerebellum, which seems to have less internal connectivity—and hence lower phi—than other neural regions, can be damaged without significantly affecting consciousness. The more Tononi, Koch and others talked about phi, information and integration, the more confused the audience became.

Participants kept calling on Tononi to settle doctrinal disputes, but his oracular responses did not always clarify matters. Someone asked: Is integrated information theory materialist, idealist or dualist? In other words, does it imply that matter is primary, or mind, or does it give matter and mind equal status? Tononi smiled and replied, "It is what it is." (Perhaps he meant, "IIT is what IIT is.") Is an explanation an explanation if hardly anyone understands it?

Workshoppers seemed especially confused by a postulate called "exclusion." According to IIT, many components of a brain—neuron, ganglia, amygdala, visual cortex—may have non-zero phi and hence mini-minds. But because the phi of the entire brain exceeds that of its components, its consciousness suppresses or "excludes" the components' mini-minds.

Exclusion helps explain why our consciousness feels (more or less) unified, but it has odd implications. If members of a group, like the participants of the workshop, start communicating so obsessively that the group phi exceeds the phi of each individual, the theory predicts that the workshop will become conscious and suppress the consciousness of the individuals, turning them into unconscious "zombies." The same could be true of smaller or larger groups, from a besotted couple to the United States of America.

A computer scientist pointed out another weird prediction of integrated information theory. According to its mathematical definition of phi, very simple, two-dimensional information-processing systems can

possess more phi than a human brain. In other words, a compact-disk player could be much more conscious than we are.

At one point participants debated whether dark energy could be conscious. Dark energy is a hypothetical substance that, according to some cosmological theories, comprises the bulk of the universe. Dark energy is thought to consist not of baryons, that is, protons and neutrons, the basic stuff of matter, but of something entirely different. When someone voiced doubt that dark energy could be conscious, Koch quipped, “Let’s not be baryonic chauvinists.”

By the time the workshop ended, I was more baffled than ever. Proponents of integrated information theory were projecting a human trait, consciousness, onto the entire cosmos. This view reminded me of the God-is-everywhere doctrine that nuns drilled into me in catechism when I was a child. Integrated information theory was dragging us back toward the dark ages, when we thought the universe revolved around us. How could someone as smart and hard-nosed as Koch fall for this, this woo?

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In his 2012 memoir Consciousness: Confessions of a Romantic Reductionist, Koch implies that personal factors influenced his professional judgment. He acknowledges that his quest to solve the mind-body problem has always been emotional as well as intellectual. He describes himself as “not only a dispassionate physicist and biologist but also a human being who enjoys but a few years to make sense of the riddle of existence.”

For most of his life he “forcefully denied that either the Freudian unconscious or traumatic memories that I didn’t know I had… were influencing my behavior.” A mid-life crisis made Koch appreciate Freud’s insights. “I learned over the past years how powerfully my unconscious inclinations, my beliefs, and my personal strengths and failings have influenced my life and the pursuit of my life’s work.”

Koch alludes to upheavals in his personal life, including the loss of his Catholic faith and the end of his 25-year marriage. He left Caltech, his home for decades, in 2011 and moved to Seattle to take charge of a brain-

research center created by Paul Allen, a Microsoft billionaire. But Koch dwells more on scientific models of consciousness than on his private life. Philosopher John Searle groused in a review that Confessions was mistitled, because “any confession where [Koch] actually admits to some serious or even trivial misdeed is conspicuously absent.”

In March 2016, I flew to Seattle to grill Koch on his private and professional lives. I was especially curious whether his mind-body expertise had helped him deal with personal problems. We met for dinner on my first night in town, which was cold and drizzly. I got to the restaurant first and sat beside a window, through which I saw Koch swoop up on a bicycle. He locked his bike to a rack and strode in, water glistening on his helmet and slicker. Baring his big white teeth, he grabbed my hand and pumped it before peeling off his gear. He had peddled here through the rain from the Allen Institute. He rides his bike everywhere, rain or shine.

Koch looked much as he did when I first met him, rangy, with a forward tilt, as if poised to bolt. He seemed to vibrate with sheer animal vitality. The restaurant was noisy, so Koch obligingly clipped my recorder’s microphone onto his collar. After we ordered our meals, I reminded him that in 1998, when he was still at Caltech, he had me over to his house for dinner. I met his wife and kids, and he revealed that he was Catholic. He still believed the neural-correlates approach was the best way to explain consciousness. He wasn’t spouting any nonsense about panpsychism. He seemed content, more than content. What the hell happened?

Koch laughed, and over the next two hours, between bites of food and sips of wine, he did his best to answer my question. Ever helpful, he packaged his life into stories, and even threw in a little psychoanalysis. He has always been compulsively neat, he said. He likes things in their proper places, in his home and office. He tied this trait to his love of science, which reveals that “despite all the appearances, the chaos on the surface of things,” nature is orderly. He became a scientist because he wanted to explore this hidden order.

His passion for order also explains his youthful affinity for Catholicism, a religion of rules and rituals. He loved its “wisdom, music, art, history,” he said. “Particularly if you go to Jesuit school early on, it gets into your blood, and it forms you.” Raised Catholic, he attended Catholic schools and became an altar boy, and when he became a father he took his son and

daughter to church.

Koch remained Catholic well after becoming the protégé of Crick, a legendary infidel. The two never really discussed Koch's religion. But by the summer of 1999, which Koch spent at a research center in Woods Hole, Massachusetts, he was reading Nietzsche on the death of God, and his faith was wobbling. One stormy night, he walked on a beach, tormented by doubt.

"I was half crying. I wanted God to show himself. I was waiting for a burning bush, a booming voice from the sky." Koch screamed into the night, "Where are you God! Show yourself!" Suddenly a light blinded him, and someone screamed back. It wasn't God. It was some guy who had been trying to sleep in a tent on the beach and was yelling at Koch to shut the fuck up.

Koch decided that God, if he exists, is "an absentee cosmic landlord." He is not a loving, judgmental being with whom we can have a personal relationship. "The God I now believe in," Koch said, "is much closer to the God of Spinoza than the God of Michelangelo or the Old Testament." Spinoza, after abandoning his Jewish faith, constructed a remarkably modern philosophy. It equates God with the abstract principles that govern order in the cosmos, principles that we deduce through reason. Spinoza's God is impersonal, an It rather than He or She. It does not love us any more than general relativity or quantum mechanics do.

When I asked if losing his faith made it harder to cope with his mortality, Koch shook his head and said he has never dwelled on death much. In fact, he didn't really confront his own finitude until his early forties. After an evening playing violent video games with his son, he woke up in the middle of the night terrified. "I just thought, 'Shit! I'm going to die!'" Within weeks he had overcome his fear and accepted that "everything that has a beginning has an end."

Unlike those gloomy existentialists who say that death strips life of meaning, Koch thinks mortality makes our lives more precious and meaningful. But after the death of his father in 2000 and Crick in 2004, he began brooding over the limited time he had left. His children also left for college, leaving him with a bad case of empty-nest syndrome, and he turned 50. At that point, he and his wife had been married for more than 20 years. They had "a very good marriage, no issues, no affairs, nothing. No problems. We raised our children, lived in a house, all very good."

But Koch felt restless, and he had an affair. "I knew from the get-go

that it wasn't good," Koch said. "You don't stay with a woman for 25 years and then, when she gets older, leave her for a sexy younger woman. That's wrong." But he couldn't stop himself. "We can't escape…" Koch paused and pressed his lips together. "We can't completely escape our biology."

Koch's mind-body expertise didn't give him much insight or control over his actions. If anything, he said, the smarter you are, the better you are at rationalizing your urges. "There are parts of the brain that are generating these very powerful emotions. Love, hate, sadness, guilt, lust. And you have very little access to that, and you only control them very indirectly." After you behave in a certain way, "you construct some scenario where you think, 'Well this is probably what happened.' Whether that actually corresponds to what happened, I think nobody knows."

Koch once assured his wife, falsely, that he had ended his affair. He went for a long, guilt-wracked run in the mountains. When he returned, his wife was holding a phone bill documenting a conversation between him and his lover. He had left the bill on a table, where his wife couldn't miss it. Koch believes he subconsciously wanted his wife to find the bill. "I'm one of the world's experts on consciousness, and my mind does this trick!"

Incidents like this made him appreciate Freud's emphasis on the unconscious. Afterwards, Koch quit rock climbing, one of his passions. "I didn't trust myself any more," he said. He worried his subconscious might decide, "You have caused too much agony. You're just going to make a mistake and end it, and your wife can just think of you as a fallen hero."

Koch nonetheless hung on to his belief in free will, his ability, albeit limited, to know and control himself. One night toward the end of his marriage, he got drunk and ran up a mountain near his home. He soon felt sick and turned back, but only after shouting into the dark the last line of the poem Invictus: "I am the master of my fate, I am the captain of my soul." "This," Koch adds in Confessions, "is a perhaps overenthusiastic expression of my position on free will: For better or worse, I am the principle actor of my own life."

Koch's marriage ended, and so did his affair, which was a "disaster." He moved from Pasadena, which evoked too many painful memories, to Seattle, where he oversees 300 researchers and an annual budget of $70 million. He fell in love with and married a professor of nursing. They moved into a sunny yellow house perched high above a lake and adopted a Bernese

mountain dog. Koch assured me that now he is “very happy, very stable.”

But Koch has always been pretty happy and stable, at least emotionally. At no point in his life has he succumbed to despair or self-loathing. “I never once went through a depression,” he said, not even when his marriage was crumbling. He conjectured that his cheeriness is largely genetic. “The biggest trick in life,” he said with a grin, “is to choose your parents well.”

Toward the end of dinner, we had an exchange that sharpened my sense of the difference between us. I said I felt bad that he had to ride his bicycle home through chill, drizzly darkness, and Koch assured me that he looked forward to the hour-long ride. You “forget yourself,” he said. “You are hyper aware of your environment but not very aware of yourself. You are in the flow.” He got the same feeling from rock-climbing before he quit.

“There’s something very Zen-like about it,” he said. “When you're climbing, you lose awareness of everything else. You lose the voice of the critic, the self-consciousness.” He gets the same feeling now from rowing crew, which he does several times a week. He strives to be “fully in the experience itself, fully mindful, fully there” during less strenuous activities. “I mean, here I am having a discussion with you, right? I like this. I’m very comfortable here. I have my wine”—he held up his goblet—“my food, good conversation. Right now, I have no meta.”

I’m always meta, I said. Koch looked puzzled, so I explained that I compulsively stand back from my life and think, Hmm, interesting. I see almost all experiences as potential material for my writing. This habit can be therapeutic. It has helped me get through hard times, like the breakup of my marriage. But it can be annoying. When I tried to meditate recently to reduce my anxiety, I kept thinking, I’m meditating, and thinking about things I should write about meditation.

“I’m not sure that’s good!” Koch exclaimed, frowning. It’s okay to think about your experiences, and think about thinking, but you also need to “be in the experience. You want to experience the experience. And if you always have this meta on, if you can never turn that voice—that point of view that looks down at you—off, I think you are missing something of life!” He looked genuinely concerned.

Partly to reassure him, partly because it is true, I told him that sometimes I stop watching myself when I play hockey in the Hudson

Highlands, which I've done for decades with a bunch of buddies. We play on ponds ringed by snowy woods, and we sometimes play after sunset, until stars shine above us, and our old eyes can barely see the puck.

"There you're not meta," Koch said, nodding approvingly, "and that's probably why you enjoy it, because you can just be in the experience. You don't have to think, 'So what's the story I can tell?' or, 'How does this relate to what other issues I have?' You're just doing what you're doing." Listening to him I had two thoughts. One was that I hadn't been entirely truthful about how I feel playing hockey. I'm always aware of who's winning and losing, and I get frustrated if my team is losing. I also thought, This is good, this meta stuff, the recorder better be picking this up.

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Koch didn't talk about science much over dinner, but he did the next day, when he gave me a tour of the Allen Institute for Brain Science. Dedicated to reverse-engineering the brain, the institute would make a terrific setting for a sci-fi film, perhaps about the birth of a malevolent cyborg. It is an immense glass cube with a hollow core lined with laboratories and conference rooms.

In one lab, hulking electron microscopes produced high-resolution images of thin neural slices, which are assembled into three-dimensional maps. In another, researchers experimented on snippets of brain from patients who have undergone surgery for epilepsy and tumors. The neurons remain alive, capable of sending and receiving electrochemical signals, for several days. Question: Does it feel like anything to be a slice of human hippocampal tissue in a petri dish?

In this sci-fi setting, Koch seemed transformed. Talking about his private life the previous evening, he had dwelled on his cognitive limits. Strolling through this transparent temple of science, he was an ebullient booster of human reason, who saw no bounds to what science can accomplish. Since his mid-life crisis, Koch affirmed, he had become "much more optimistic" about science's power to solve mysteries. He rejected the idea that any problems might be intractable.

“It’s this, this, this defeatism,” Koch said, grimacing. It is “fraught with danger to claim that we will never understand,” because that belief could become self-fulfilling. “Whenever philosophers have said we cannot understand, they have been proven wrong.” The 19th-century philosopher August le Comte declared that we would never know what stars are made of just before the invention of spectroscopy, which revealed what stars are made of.

Some mysteries do seem daunting, such as the origin of the cosmos, why there is something rather than nothing. But this problem might eventually yield, Koch said, perhaps to one of the multiverse theories cosmologists are toying with, which postulate that our universe is just one of many.

Although we can never directly observe other universes, we might accept them as real if the circumstantial evidence becomes compelling enough. “Just like I believe fervently there are other conscious minds, it may be that years from now we believe fervently, ‘Yeah, it’s established, there are other universes.’”

Koch was especially confident that science would crack the hard problem. “All the problems associated with consciousness, in the fullness of time, unless we stop doing science or we have a nuclear catastrophe, will be solved.” He called integrated information theory “a very good step in right direction. It’s the first theoretical progress we’ve had since Descartes.” Yes, panpsychism “is a strange consequence of the theory,” and so is the prediction that a compact-disc player can be more conscious than a human, but quantum mechanics and relativity have crazy implications too.

Neuroscientists are developing techniques for measuring the informational complexity, or phi, of brains and other systems, which according to integrated information theory is proportional to consciousness. These advances, Koch said, could lead to a “consciousness-meter” that measures consciousness as objectively as a thermometer measures temperature. Such a device would bypass the solipsism problem. It would determine whether it feels like anything to be a spider, octopus or smart phone.

Koch thinks science might even determine what makes life meaningful, worth living. This is what philosopher Owen Flanagan calls the really hard problem. “I see no reason why science shouldn’t look at that,”

Koch said, “as long as you can describe it in some precise fashion.” Science can investigate “what makes people content. Is it pure pleasure? Well, it turns out that it’s more than pleasure, it’s to give people a meaningful life.” Science can help solve all parts of the mind-body problem. It can tell us what we are, can be and should be.

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Real literature, I learned in college, resists reduction. Interpretations of Ulysses or even a short story like “The Dead” are hopelessly inadequate. They always miss something. That is much truer of real events. The above rendering of my encounter with Koch, distilled from five hours of sprawling conversation at the restaurant, Allen Institute and his home, leaves out his many hedges and second-guesses, as well as his asides on the “Buddha-hood” of dogs (“they can’t dissemble… they are in the here and now”), the hyper-sexuality of modern humans (because of the hyper-sexuality of modern media), the risks of artificial intelligence (which at some point “might outsmart us”). I could dump the full transcript or audio recording online, but they wouldn’t reveal what was going on in our heads or around us.

With these caveats, I’ll take a shot at interpreting Koch. When I met him in the early 1990s, he had a hardheaded view of science’s limits. His mid-life crisis rubbed his face in the limits of his own reason, self-knowledge and self-control. And yet he emerged from the crisis with more confidence that science can solve the mind-body problem.

In Confessions, Koch offers a startling explanation of his intellectual swerve. Early in his career, when he was still Catholic, he was motivated by an “entirely subterranean desire to justify my belief that life is meaningful.” Fulfilling that desire meant proving that science cannot comprehend the “mind-body divide,” the “essential mystery at the heart” of existence.

Got that? Koch’s unconscious self didn’t want his conscious self to explain consciousness. When he was quoting Dirty Harry on the limits of knowledge and reminding Chalmers of the solipsism problem decades ago, Koch wasn’t rational. He was under the spell of an unconscious impulse motivated by his Catholicism. After he lost his faith in God, he became more

fully committed to reason.

This is an intriguing hypothesis, but I don't buy it. Koch is an unreliable narrator of his own life. I have come up with several explanations for his swerve, which are not mutually exclusive. The most mundane holds that Koch has been transformed by his role as director of the Allen Brain Institute. As the manager of a high-profile research program, he can no longer indulge in speculation about the limits of science. His job requires him to be a scientific optimist, even a booster.

A deeper cause of Koch's intellectual swerve is his sense of death's approach. Within the span of a decade, he lost his God, his biological father and his intellectual father, Crick. Feeling the chill of mortality, Koch became dissatisfied with his life, and he did what many middle-aged husbands do, he had an affair with a younger woman.

Koch also began to see the flaws of the neural-correlates approach to consciousness, to which he had long been wedded. That paradigm implies, as Crick put it, that we are "nothing but a pack of neurons." It strips us of concepts that help us make sense of our lives—souls, free will, even selves—and gives us little or no meaning in return. The language of neuroscience is disconnected from the psychological, moral and spiritual realm in which we live our lives.

If Koch gave Socrates a tour of the Allen Brain Institute, the old know-nothing/know-it-all would surely be mightily impressed with brain-mapping technologies and other marvels. But Socrates would have derided the claim that neuroscience can solve the mystery of who we are. Oscillations of neurons, Socrates would point out, can't explain why he ended up in prison any more than muscle contractions can. Nor can neural oscillations explain why Koch drifted away from his Catholic faith.

After that crisis, Koch needed more oomph from science. He convinced himself that his scruples about science's limits were irrational, and he fell into the arms of sexy, exotic integrated information theory. The theory is far more ambitious and meaningful than the dull old neural-correlates model advocated by him and Crick. It depicts us as nodes in an infinite web of information, a cosmic consciousness that is pretty close to God, the God of Spinoza if not The Bible.

But Koch is not a drowning man grasping at a straw. Intellectuals tend to be angst-ridden, but Koch, even taking into account his (mostly)

subliminal fear of death, is endowed with an unusually high intelligence/angst ratio. He knows how to live life, and not just treat it as an intellectual puzzle. His mind and body exist in harmony, which he projects onto the cosmos. That is another reason why he fell for integrated information theory, because it reflects his sunny worldview.

Integrated information theory denies that consciousness is something meta, an add-on to the universe, a freakish, random occurrence that as far as we know emerged only on this tiny planet billions of years after the universe exploded into existence. According to the theory, consciousness has been woven into the fabric of the cosmos from the very beginning. It was glimmering in the incandescent plasma of the big bang.

Koch imbues integrated information theory with spiritual significance. It validates the mystical belief of the ancient Greeks that "mathematics is the ultimate reality," he writes in Confessions. He compares conscious states, as described by the theory, to multidimensional crystals. The "dream of the lotus-eater, the mindfulness of the meditating monk, and the agony of the cancer patient feel the way they do because of the shape of the distinct crystals in a space of a trillion dimensions—truly a beatific vision."

Koch's affinity for integrated information theory isn't entirely rational, nor is my distaste for the theory. Unlike Koch, I've always felt apart from the world and from myself. I'm always meta. Reality, and our consciousness of reality, strike me as fundamentally weird. Psychedelics exacerbated this feeling. They convinced me that not even God, if there is a God, knows what the hell is going on.

This conviction, after I became a science writer, mutated into the belief that science will never solve the mystery of existence. Koch, back in the 1990s, seemed to share my sense of science's limits. No wonder I found him such an appealing source. And no wonder I felt betrayed when he declared that consciousness is solvable, and that integrated information theory might be the solution. If Koch is an unreliable narrator of his own life, so am I. We all are. "One is not one's own historian, let alone one's own psychoanalyst," Thomas Kuhn warned when I asked him how he came up with his postmodern philosophy.

My views of the mind-body problem, like Koch's, have swerved. Mind-body research resembles one of those images that can be interpreted in

two ways. Vase or human profiles? I once disdained the wild abundance of mind-body stories. The failure of mind-science to converge on a unifying paradigm meant that no theory works very well. Now I see that same abundance as an expression of our creative, protean nature, and of our freedom. And the more I think about integrated information theory, the more I see its merits. After attending the 2015 workshop on the theory, I criticized it on my blog but tacked on an upbeat conclusion:

"I loved the workshop. Watching all those brainy participants grappling with the deepest conundrums of existence, citing Descartes, Leibnitz and Hume as well as papers less than a year old, was the most exhilarating intellectual experience I've had in a long time. Whatever phi is, my brain brimmed with it by the workshop's end. Pondering IIT has deepened my appreciation of the mind-body problem. In an age of rampant scientism, we need theories like IIT to help us rediscover the mystery of ourselves."

When I wrote that final sentence, it was bullshit. I was trying to be nice to Koch and other proponents of integrated information theory. Now I retroactively mean what I wrote. Mind-body stories like integrated information theory, whether or not they are true, really do help us appreciate the mystery of ourselves. In that sense, they work.

In the 1990s Koch insisted, like his mentor Crick, that mind-body stories conform to materialism, the idea that only matter really exists. And the stories had to be about the brain, the one object we know is conscious. I admired Koch for that hard-headedness, and for his efforts to tame an unruly field. Now I admire him for escaping the brain's gravitational pull and rocketing into the wild reaches of theoretical possibility.

Mind-body philosophers speak of the "explanatory gap" between our physiological models and the mind as we experience it, but the metaphor should be flipped. Our objective knowledge of ourselves is like a dust mote floating in uncharted space. Given our unbounded ignorance, we should be free to invent mind-body stories that console and exalt us, that mirror our fears and desires. Here's the catch. We should not insist that integrated information theory or any other story is the final, definitive solution to the mind-body problem. There can be no final solution, because science cannot eradicate subjectivity from its accounts of consciousness.

Koch hopes integrated information theory might lead to a

consciousness-meter, which determines whether a given thing is conscious, and how conscious it is. But scientists cannot build a consciousness-meter until they reach agreement on what physical conditions are necessary and sufficient to produce consciousness. And scientists cannot reach agreement on those conditions unless they have a means of solving the solipsism problem, that is, a consciousness-meter.

Lacking a consciousness-meter, our views of the hard problem will always be subjective, a matter of taste. You think only humans are truly conscious, and we're a lot less conscious than we think we are, whereas I think everything is at least a little conscious, including jellyfish, compact-disk players and dark energy. Nor will science ever solve the really hard problem, because our ideas about what makes life meaningful are even more subjective and divergent than our ideas about consciousness. I bet even if we merge into one meta-mind, like the Borg in Star Trek, we'll still be bewildered.

Deep down Koch surely suspects, even hopes, that our quest for self-knowledge will never end. That may be why, in Seattle, he urged me to check out Solaris by Stanislaw Lem. After I flew home, I read the novel, originally published in Polish in 1961. It is, ostensibly, a story about humans encountering an alien consciousness, in the form of a sentient ocean, on a planet called Solaris. But Solaris is really about the strangeness of our own selves. Kelvin, the narrator, becomes as bewildered by his own mind as by the oceanic mind of Solaris. He's not sure what is real or unreal, whether he is dreaming, imagining, perceiving. He's not sure what he wants or doesn't want.

One section of the book is a history of "Solaristics," scientific efforts to comprehend the sentient planetary ocean. "The subsequent years abounded in theoretical models of the living ocean, all highly complex and based on biomathematical analyses," the history notes. "The third period involved the collapse of what had hitherto been largely monolithic opinion on the part of scholars. A multiplicity of schools appeared, that often fought furiously with one another."

This passage, written in a communist state in the early 1960s, is a dead-on description of the paradigm explosion of modern mind-science, in which Koch has played a central role. Kelvin, the narrator, bitterly calls Solaristics "a substitute for religion in the space age. It is faith wrapped in the

cloak of science." He muses: "Human beings set out to encounter other worlds, other civilizations, without having fully gotten to know their own hidden recesses, their blind alleys, well shafts, dark barricaded doors."

Yes, inner space is as infinite as outer space. The self is the hole, the blind spot, at the center of every worldview. If we look unflinchingly inward, we will be filled with what Socrates called "strange confusion." We will see ourselves as baffling, unknowable, alien, weird. Someday we might convince ourselves that the Era of Strange Confusion is over, that we have solved the mind-body problem, figured ourselves out. We will exult in our triumph. But when we stop seeing ourselves as weird, we are not really seeing at all. We are missing the gorilla standing right in front of us, sticking out its tongue. I rarely see, really see, the weirdness. I get so absorbed in my trivial schemes and troubles that I take reality for granted. But as I read Solaris, that old estrangement crept over me again. Thanks, Christof.

## Chapter Two
## **The Cognitive Scientist: Strange Loops All the Way Down**

By the time I flew to Indiana to meet Douglas Hofstadter, I was so steeped in his writings that I found myself thinking like him, or like I like to think he thinks. I thought, I'm looking out the plane at a plain, which is also a plane. In my notebook I jotted, Indiana, the Blank State. But the landscape wasn't blank. It was an Escher print, a recursive geometric puzzle receding to a blurred horizon, a metaphor for infinity.

My feeble punning efforts made me appreciate punny-man Hofstadter all the more. For him, the world is a cosmic, multidimensional pun seething with meanings. His writings, especially his first book, Gödel, Escher, Bach: an Eternal Golden Braid, dwell on deep isomorphisms, or resemblances, between patterns in nature and in mathematics, art, music.

Gödel, Escher and Bach, the mathematician, artist and musician, are isomorphs of each other and projections of a deeper structure. An image at the beginning of the book illustrates this idea. An odd geometric object, a three-dimensional rune, hovers in a cube. Light shining through it casts shadows on the walls of the cube: G, E, B. What is the object? Hofstadter's book? His mind? His God? Hofstadter calls Gödel, Escher, Bach "a statement of my religion."

He is obsessed with self-reference and recursion, with things that do things to themselves, repeatedly.

These concepts are embedded in what he calls the "strange loop." This is Hofstadter's big idea, which winds through and binds all his work. A strange loop is something that does something to itself, that defines, reflects, restricts, contradicts, plays with and creates itself. Like Gödel's theorem about the limits of theorems. Escher's drawing of hands drawing each other. Bach's fugues, which curl back upon themselves like Mobius strips. Language, which consists of words defined by other words, is a gigantic strange loop, and so are music, art, mathematics, science and all of human culture. Human minds are the strangest, loopiest loops of all.

Gödel, Escher, Bach is a strange loop too. It has a fugue-like

structure, with recurrent themes and motifs, and it constantly talks about itself. Every other chapter is a Lewis Carroll-esque dialogue between Tortoise and Achilles, as well as other mythical and real characters, about what Hofstadter just talked about. Hofstadter joins Tortoise and Achilles in the final dialogue, along with Charles Babbage and Alan Turing.

Martin Gardner, the mathematics columnist for Scientific American (whom Hofstadter replaced after Gardner retired), said of Gödel, Escher, Bach: “Every few decades an unknown author brings out a book of such depth, clarity, range, wit, beauty and originality that it is recognized at once as a major literary event. [This] is such a work.” Only re-reading it before flying to Indiana did I appreciate that Gödel, Escher, Bach is a 777-page assault on the mind-body problem. Strange loops serve, for Hofstadter, as a general principle of cognition, whatever form it takes. Intelligent machines, if we ever build them, and aliens, if we ever encounter them, must have loopy minds, as we do.

Hofstadter explains, in painstaking detail, how purely physical processes generate minds and meaning. His answer is that loops at the level of particles, of electrons and quarks, give rise to loops at the level of biology, genes and neurons, and eventually at the level of symbols, concepts and meaning. Our minds are symbol-processing strange loops that are generated by and exert influence over matter. Weave all these loops together and you get the “eternal golden braid” of existence.

Gödel, Escher, Bach is at once highly technical—with detailed digressions on physics, mathematical logic, computer languages and DNA transcription—and trippy. Psychedelics, at their best, reveal reality as an endless play of forms, a joyous dance that transcends bad and good, that is simply beautiful, so beautiful your brain melts and leaks out your ears, as an acid head might put it. Hofstadter is one of those rare souls who dwells permanently in that sublime, magical realm. Or so I imagined when I first encountered his work long ago, before I became a science writer. He is also blessed with the talent to give us glimpses of his world.

Hofstadter’s detractors dismiss him as “clever.” That is grossly unfair, but I know what they mean. His playfulness can be relentless, exhausting. You can’t just read Gödel, Escher, Bach, you have to study it. Hofstadter assigns exercises, which he assures you will be lots of fun. “Try it!” he orders. At times, he resembles a too-enthusiastic camp counselor exhorting

you to play a super cool game. If you skip his exercises (as I usually do), you feel lazy and guilty, and start to resent the counselor.

There is something chilly, almost inhuman, about Gödel, Escher, Bach. It delves so deeply into the machine code of meaning that it leaves ordinary human meaning behind. Hofstadter also feared after writing the book that many readers missed its central point. He had solved the mind-body problem, the mystery of who we really are. Hofstadter wrote I Am a Strange Loop, published in 2007, to spell out this theme more clearly, to explain "what an 'I' is." He writes, "I hope this book will make you reflect in fresh ways on what being human is all about—in fact, on what just-plain being is all about."

Strange Loop is warmer than Gödel, Escher, Bach. It is not just a book about meaning, it is a meaningful book, because it grapples with grief. Hofstadter says as much in the preface. Referring to himself, as he often does, in the third person, he notes that the author of Strange Loop "has known considerably more suffering, sadness and soul-searching" than the author of Gödel, Escher, Bach.

In 1993, Hofstader's wife Carol died "very suddenly, essentially without warning, of a brain tumor." Not all deaths are tragic. This one was. Carol was 42, and she left her husband with two children, two and five years old. How do you make sense of such a death if you don't believe in God? Souls? Heaven? Hofstadter couldn't make sense of it, but he tried.

One chapter of Strange Loop consists of email exchanges between Hofstadter and his friend Daniel Dennett, in which Hofstadter vents his grief. Although his wife's body is gone, Hofstadter writes, her "consciousness, her interiority, remains on this planet." Just as the Sun is ringed by a radiant solar corona, still visible even when it is eclipsed, so do we, when eclipsed by death, endure in the minds of those who knew and loved us. We live on as "soular coronas."

I resist envy, as a matter of principle, but it was hard not to envy Hofstadter. From the perspective of my dim, halting self, he seemed blessed with the ideal scientific-artistic-mystical mind, a marvelous, frictionless machine for generating epiphanies. Yes, he has endured tribulations, like all mortals, but his intellect helped him see existence as sublime, in spite of everything. Again, so I imagined. I also owed Hofstadter a debt. Reading Gödel, Escher, Bach and "Metamagical Themas," his column for Scientific

American, in the early 1980s made me want to become a science journalist.

I was mulling all this over as I flew south over the flatlands of Indiana. I scanned my sheet of questions. How Hofstadter became interested in music, mathematics, the mind-body problem. How he was affected by the death of his wife, and the disability of a sister. The famous lines popped into my head: “Beauty is truth, truth beauty,—that is all/Ye know on Earth, and all ye need to know.” This could be Hofstadter’s motto. At the top of my question sheet I scribbled: “Keats: Beauty = Truth?” Yeah, ask about that.

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After landing in Indianapolis, I drove a rental car south on Route 37. As I approached Bloomington, the landscape began undulating, sprouting groves and rocky knolls, like premonitions. As I pulled into the driveway behind Hofstadter’s two-story brick home, he emerged from his house to greet me, wearing a topologically and chromatically complicated sweater-jacket. His smile seemed forced, more like a grimace. His head looked too large for the stalk of his body, and he appeared younger and older than his age, boyish and wizened. He peered at me warily from beneath dark eyebrows.

Entering the house, we stepped over an ancient golden retriever. The dog strained to lift his white-muzzled head, and his rheumy eyes took us in with a bewildered expression. I trailed Hofstadter into a living room crammed with books, vinyl records, sheet music, concert posters, busts of composers, a piano and other musical instruments. Pale light fell through filmy, curtained windows. I offered a pleasantry about how “lived in” his home felt.

“What do you mean?” Hofstadter asked sharply.

The house felt filled with memories, I said carefully, with things accumulated over the course of a long, well-lived life.

It is filled with memories, he said, with things that date back to his childhood, like books and records that belonged to his parents. He fetched a scrapbook and showed me a telegram that congratulated his father, Robert, on winning the 1961 Nobel Prize in physics. The telegram was signed by President John F. Kennedy. “I am a person who is very deeply connected to

the past," Hofstadter said. His second wife, whom he married in 2012, doesn't share his fondness for old things. She lives in a different house, newer, cleaner.

I settled on one couch, Hofstadter on another perpendicular to mine. He occasionally smiled or chuckled, but his default expression was grim, inward-looking. He sat slightly hunched over, head tipped forward, as if steeled for a blow. He became animated when I asked how he got interested in the mind-body problem. His fascination with the mind had emotional as well as intellectual roots. His younger sister Molly was born with a neurological disorder, and she never learned to speak. His parents considered but did not pursue brain surgery to search for the cause of the disability.

The prospect of the operation "was very, very eerie to me, anxiety-provoking and scary. And it was the first time that I actually thought about the idea that what goes on inside one's skull is what is giving rise to one's so-called consciousness. And I use 'so-called' because I think of it as an illusion." Hofstadter might have meant to provoke me with this assertion, but I let it pass (and I'll examine it later).

He consumed books on the brain, including one by Wilder Penfield, a neurosurgeon who performed experiments on epileptics. After cutting away their skulls, Penfield stuck wires in the epileptics' brains and zapped them with electricity. Patients stimulated in this way had visions and recalled long-forgotten scenes from their childhoods.

"I realized that if you look at a brain, it would just look like an ordinary lump of stuff. And you couldn't see anything related to thought, whatsoever. It was just some kind of meat, you could eat, a brain. How did that give rise to all of these colors and sensations inside? That was a scary but fascinating issue."

Hofstadter was also entranced as a child by things that do things to themselves. He dwelled on the strangeness of multiplying 3 times 3 times 3, or of finding two identical numbers that when multiplied produced 2. (His father, after young Douglas mentioned the latter puzzle, told him he had discovered something called a "square root.") "And of course I loved paradoxical things, like 'This sentence is false.' The twistiness of such things was very interesting to me."

Browsing in a bookstore in his mid-teens, Hofstadter came across a book that explained Gödel's theorem, one of the most momentous advances

in the history of ideas. In 1930 Kurt Gödel, a 24-year-old Austrian logician, proved that any axiomatic system powerful enough to describe the natural numbers (0, 1, 2, 3,...) is "incomplete." That is, it will generate infinitely many true statements that it cannot prove.

"It was magical!" Hofstadter exclaimed, as if reliving the thrill of his youthful discovery. Gödel provided deep insights into "the nature of symbols and language and meaning," and he showed that a formal system, which "looked on the surface to be a completely inert structure," could refer to and yield insights into itself. "A sentence could say, 'This sentence cannot be proven in this system.'"

Hofstadter suspected that similar self-referential processes transform neural operations into mental ones. "A brain doesn't look like anything that a priori can support consciousness," he said. "It just looks like a piece of flesh. But because of the looping around that can take place, because of the perceptual processes, because of the way that the neurons can respond, you get a self-referential structure built up in it, and things can happen."

Hofstadter plunged into mathematics and logic in order to pursue his ideas further. He gained access to a computer at Stanford University, where his father worked, and programmed it to generate sentences based on recursive rules. He delighted in feeding punch cards to the mainframe, which ground through the program, lights flashing, and spewed out reams of paper covered with symbols. If a brain can become self-conscious through self-referential processes, he thought, perhaps a computer can too.

Recalling these childhood adventures, Hofstadter was transported by the same enthusiasm that animates his writings. I expected that. What I did not expect was the intensity of his antipathies. Take, for example, his response to my question about Buddhism. I assumed that Hofstadter had an affinity for it, because he, like Buddhists, sees the self as illusory. Gödel, Escher, Bach also riffs repeatedly on Zen.

"I hated Zen," Hofstadter replied. Zen was "the antithesis of everything I believed in." The Zen riddles called koans, like what is the sound of one hand clapping or what did your face look like before your parents were born, were "self-contradictory pieces of nonsense, absolute nonsense." Precisely because they were so ridiculous, koans became a "pet peeve that I played around with." That is how they ended up in Gödel, Escher, Bach.

When I asked if he ever considered becoming a philosopher, Hofstadter said he disliked philosophers. He found them obscure, simple-minded, shallow, dogmatic. “They fell for all the obvious ideas and then latched onto them with a fury or fervor that I couldn't understand.” Bertrand Russell “was the quintessence of that for me. Gödel was deep, and Russell was shallow.” There are exceptions, such as his old friend Daniel Dennett, but most philosopher are “players with words.”

He hated philosophical jargon, like metaphysics and ontology, and Latin terms like qua and cetiris paribus. “I just found it pompous, pretentious, show off-y, and empty.” Philosophers of mind were the worst. “Reductionism, functionalism, everything was an ism.” Many philosophers, he suspected, “would have liked to be scientists but weren’t good enough.” He brooded a moment. “I don’t mean to be too harsh, because we all have our limitations. We all have things we would have loved to do and couldn’t. But…”

A question about computer science provoked another outburst. Hofstadter assured me that he never considered becoming a computer scientist. “I hated nerds, and to me the world of computers was filled with very nerdy people,” he said. “I didn't want to hang around people who were going to do nothing but talk about computers.” Young Hofstadter aspired to be a mathematician, but he hit a ceiling toward the end of college. By that time, he had decided mathematicians were as “weird and nerdy” as computer scientists, so he happily switched to physics, his father’s field. “This could be sour grapes, but I could say, ‘Phew! I’m glad to be out of math,’” he said.

Physics seemed, initially, like the perfect fit. As a boy, he loved listening to his father talk to his fellow physicists, using terms like angular momentum, wave mechanics, electron scattering, klystron tubes. Unlike computer scientists and mathematicians, physicists weren’t nerdy. Physicists “loved the mountains, they loved nature, they loved music, they loved art, they loved words, they loved history.” Physicists were “the most cultured people in the whole world,” he said. “That was the kind of company I wanted to keep.”

Hofstadter cherished stories about the pioneers of particle physics, such as Wolfgang Pauli. In the 1930s, observations of radioactive decay didn’t make any sense. They seemed to violate the laws of conservation of energy and momentum. Pauli proposed the existence of a new particle, the

neutrino, to salvage these conservation laws, but he did so with reluctance, even “shame,” Hofstadter said. “One particle, to save three of the most fundamental laws of physics!” Experiments have confirmed the existence of neutrinos.

Hofstadter entered particle physics, which seeks the fundamental stuff of reality, but he came to loathe that field too. “I became more and more lost and repelled by the ugliness of theories that I was seeing. I just could not stomach any of it.” By the early 1970s, when he was a graduate student at the University of Oregon, physicists were proposing new particles left and right with little or no justification. In a seminar, Hofstadter savagely criticized a paper that postulated the existence of 156 new particles. He finished his presentation by declaring that proponents of the theory “have no sense of shame.” He shouted, “I quit!” and stomped out of the room.

Hofstadter switched to solid-state physics, although he had disdained it as glorified engineering. In 1974, studying the behavior of a crystal immersed in a magnetic field, he made an unexpected discovery. The energy values of electrons in the crystal formed a “wispy” graph with remarkable properties. The term “fractal” hadn't been invented yet, but the graph is a fractal. When you examine a fractal at smaller scales, the same pattern recurs with slight variations. Hofstadter called the graph “Gplot,” but others have dubbed it “Hofstadter’s butterfly.”

I was struck, listening to Hofstadter, by his aesthetic sensitivity. Beauty, it seemed, is at least as important to him as truth. I remembered the question I had scribbled down in the plane. Your work, I said, reminds me of the old Keats aphorism, Beauty is truth…

He snorted. “That’s nonsense. Absolute junk. That’s the opposite of what’s true. I hate that phrase.” He was so vehement that I started laughing. “Germany killed six million Jews,” he said, scowling. “That's true. Does that make it beautiful? Come on. Nonsense.” I wasn’t laughing now. But your writing is so beautiful, I said, to mollify him, and because it is true.

“I think we should try to bring as much beauty into the world as we can,” he said, “since the world is so non-beautiful!” He seemed genuinely furious. But, but, I sputtered. Your writing draws attention to these beautiful, deep structures—in music, mathematics, in our selves.

“Hitler had a self, but not a beautiful one,” he retorted. Not every strange loop “is a beautiful thing that gives rise to beauty in the world. It can

give rise to mass murderers and serial killers and rapists." Hofstadter saw the world as "filled with anguish." During the course of evolution, "trillions of creatures have suffered at the hands and claws of others. I don't think of that as beautiful in any way, shape or form, I think of it as horrible." He called evolution "horrendous," "ruthless," "violent."

Fortunately, some humans are capable of recognizing and overcoming this natural violence and cruelty. He chose at an early age not to eat animals or wear pieces of them, and he strives to be kind to people. "I see the world as being the site of tremendous pain. But for that very reason I think it's very important to try to be gentle and kind and empathetic and compassionate, and to help suffering people. Because the world is so cruel and merciless."

Even as a child, Hofstadter said, he was "very, very aware of the sad sides of life." He clipped out articles about murders and kidnappings, "horrible events that wrenched my gut," to honor the victims. "I felt that out of respect to these people, I would clip the article, so in some sense that little shred of them remained alive." Hofstadter still had the clippings.

From adolescence on, he was also tormented by yearnings for "romance." He loved romantic films and music. Songs by Rodgers and Hart, Cole Porter and George Gershwin were favorites. These "permeated me and gave me an extremely romantic vision of life." He desired a specific kind of female beauty, which unfortunately also attracted other males. This "narrow resonance curve" meant that he was "almost doomed to be a failure, to not find a girlfriend I wanted." As a young man he had moments of happiness, even joy, composing music on a piano, swapping "bon mots" with friends. But his longing for love gnawed at him.

"I don't want to say that if you had met me at that age that you would have said, 'That's the unhappiest person I've ever seen.' You'd probably say, 'That's a funny guy. He's got a good sense of humor, but he's sad. He's a sad guy. He's very fun, he has a bright, chipper side, and he's the first to come to your aid if you are sad. He'll try to cheer you up, and he's never one to make you feel sad, or to say that life is unhappy. But he has suffered, he has been striving and struggling constantly. He has had bad luck with romances, and it really hurts him.' That's what you'd say. 'Poor guy, he's struck out.'"

Hofstadter didn't have his first serious relationship until his mid-30s, after Gödel, Escher, Bach was published. When I asked if he struggled to keep his melancholy out of the book, Hofstadter scowled. "Why would I even

think of bringing in melancholy," he said. "It was irrelevant."

But as time went on, he revealed more of himself in his writing, "happy things but also a lot of sad things." He realized that "first-person stories are very, very powerful ways of getting ideas across." That was why in I Am a Strange Loop he wrote about the death of Carol, the woman with whom he finally found love. They married in 1985, and she died eight years later. After her death Hofstadter felt "infinite sadness," but sadness wasn't new to him. He had always carried it within him.

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Some of Hofstadter's philosophical positions seem self-punishing. Although his work strikes me as one long argument against the reduction of minds to physics, he calls himself a reductionist. "We should remember," he writes in Gödel, Escher, Bach, "that physical law is what makes it all happen, way, way down in neural nooks and crannies which are too remote for us to reach with our high level introspective probes."

Hofstadter asserts that consciousness is "not as deep a mystery as it seems." It is a pseudo-problem, because consciousness is an "illusion." By this, Hofstadter seems to mean that our conscious thoughts and perceptions are often misleading, and they are trivial compared to all the computation going on below the level of our awareness.

Hofstadter also contends that free will is an illusion. I told him that simple introspection made me believe in free will. At key times in my life, I have all-too-consciously faced choices, agonized over them, and made decisions, for example about my career and love life.

"I don't feel as though I have made any decisions," he replied. "I feel like decisions are made for me by the forces inside my brain." He paused. "I don't object to the notion that there is will, and a battle of wills, but there is nothing free." If he stops to buy gas and spots potato chips in the gas station, he is subject to competing forces. One, he is hungry. Two, he's worried about his weight. The stronger force prevails. "There is no freedom. There's a conflict, a tussle, battle free-for-all." He paused. "An un-free for all, combat, where the stronger force wins."

What about the moral reasoning that led him to become a vegetarian? As a child, he replied, he saw “carcasses being unloaded from trucks into the back of grocery stores. I asked my parents what meat was and found out.” Eventually his horror at the slaughter of animals overcame his desire to eat meat and to conform, to do what most people do. “At that point, I snapped, and became a vegetarian.”

Hofstadter is, in most respects, a hard-core skeptic, who denies himself beliefs that comfort others. He rejects God, the afterlife, the soul and free will. He seems to derive comfort, however, from his faith in a Platonic realm of sublime forms. The forms exist independently of us, but if we are lucky, we can discern them.

His Platonism emerged when he talked about the quantum fractal that bears his name, Hofstadter’s butterfly. He compared it to a shell on the beach, half-buried, waiting for him to stroll past. “It was partly covered, mostly covered, but I happened to be the right person in the right place at the right time, because I had had preparation to recognize it.”

Many scientists and philosophers would agree with Hofstadter about the Platonic nature of mathematical and scientific truths like the Pythagorean theorem or general relativity. His more radical claim is that works of music, poetry and art are also discovered. His conviction, again, comes from personal experience. When working on a book, Hofstadter writes, deletes, re-writes, revises. “I keep doing it over and over again until I produce something I am happy with,” he said. “It’s not like I’m really inventing anything. I’m sort of just discovering things that work. And there’s a lot of chance involved.”

Hofstadter’s Platonic view of his work is, from one perspective, arrogant, because it implies that his ideas and their formulations are transcendent and timeless, like pi. But it is also humble, even self-negating, and consistent with his rejection of free will. Hofstadter didn’t create Gödel, Escher, Bach. He just happened to notice it peeking from the sand while he was strolling along the shore of Platonic forms.

Hofstadter believes that even our responses to art have a Platonic quality, and that there is an objectively true, “correct” way to respond to a painting, poem or passage of music. This perspective implies that a beauty-meter and meaning-meter, which render objective aesthetic judgments, might be possible. To illustrate his view, Hofstadter told me a story. He was

teaching a seminar, “Fugues, Canons and Inventions,” in the music school of Indiana University. One day, he played a snippet from a Handel overture and asked if the students heard any “sadness,” or “wistfulness.” They didn’t. “They just heard it as happy.”

The next day, Hofstadter played the piece again. This time, he said he would raise his hand when he heard sadness, and he asked the students to raise their hands if they heard it, too. Many of the students raised their hands when Hofstadter did. “One student said something I liked: ‘Now that I listen carefully, I can hear the sadness throughout.’ And I thought, ‘Wow, what a revolution.’ They were all saying it was happy at the beginning. And at the end, they hear that pervading the happiness—sort of under, hidden inside it—is unhappiness.”

I’m a teacher, too, and I have a different take on this incident. Some students might have genuinely heard the sadness the second time around, but only because they succumbed to Hofstadter’s power of suggestion. Others might have pretended to hear the sadness because they wanted to curry favor with their grade-giver. Or they felt sorry for him. Or all of the above. Students are complicated creatures. I could listen to the Handel piece myself and judge it for myself, but there’s no point. I’ll remember Hofstadter and feel the undertow of melancholy.

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My most serious bout of melancholy dates back to the early 1980s, around the time I discovered Hofstadter’s writings. After a woman broke up with me, I tumbled into acute depression. Her name was Faith, which somehow made it worse. Sometimes, with effort, I could go meta. That is, I could stand apart from myself and see my condition as something exotic, like a black hole in my head. I would observe the event horizon, its distortion of time and space, and think, Hmm, interesting.

Meta-ness, jumping out of a system and seeing it from the outside, is a major theme of Hoftstadter’s work. And yet going meta does not seem to mitigate his melancholy much. For intellectual and temperamental reasons, he confronts the darkness squarely. In spite of what I implied above, I don’t

think Hofstadter's vision of the world as "filled with anguish" is pathological, a projection of his tormented self. It is accurate. That makes it all the more remarkable that he has produced works brimming with beauty and joy.

Among the many striking images in his work, my favorite is a photograph in Strange Loop of Hofstadter and a bunch of students. Each sits on the lap of the person behind her, who sits on the lap of the person behind him, and so on. Pull one person from the circle and it collapses. It's a self-sustaining, virtuous circle, a lovely loop, a lovely metaphor for humanity. Hofstadter, whose face is half-turned toward the photographer, is beaming. He looks truly happy.

Hofstadter's riffs on the mind-body problem make me feel exhilarated when I get them and inadequate when I don't, which is often. Trying to wrap my loopy mind around his loopy model, I always end up baffled, my mind twisted into knots. The model moves and eludes me in the same way a great but difficult poem does. I know I am in the presence of something deep and beautiful, even though I don't quite get it. I feel like I'm missing something.

With trepidation, I told Hofstadter that he seemed to straddle the realms of science and art. To my relief, he nodded. "I have one foot in science and one foot in art—where art can be taken as music, visual art, literature, those things—and another foot in physics, math and a little tiny bit in biology. And then of course psychology, cognitive science. I am a completely and totally hybrid person."

And yet Hofstadter thinks he has solved the mind-body problem. The strange loop is the "correct" answer, he said, to the question, "What is a soul, or self, or I?" He wished more people shared his view. "I would have liked it if people had said, 'That is the answer, that is right, that is the correct way of looking at things.' I don't think people have said that."

Many mind-body theorists—again, his friend Daniel Dennett is an exception—don't like his loop model because they "don't like the idea that consciousness is an illusion." Philosophers disrespect him because he disrespects them. "I don't cite philosophy," he said. "I don't use their ism words, I avoid them like plague. I don't use any jargon of theirs, and so they just ignore me. I guess that's the price I pay."

Trying to cheer him up, I said that his work is too original and idiosyncratic to serve as the foundation for a school of thought. It is an outlier, like all great works of art. Hofstadter nodded. One of his favorite

books is Lexicon of Musical Invective, a collection of vicious reviews of great composers. “It’s extremely funny to read,” he said. “It makes you realize that no matter who you are, how much genius you have, there are going to be people who hate you.”

I don’t know any mind-body theorists who hate Hofstadter. Nor do I know any who think he has solved the mind-body problem, or even pointed in the direction of a solution. Christof Koch, althought he loved Gödel, Escher, Bach, said that Hofstadter’s strange-loop model doesn’t yield testable predictions, and it’s more about self-consciousness than consciousness. David Chalmers, who earned his doctorate in philosophy under Hofstadter, never saw the strange-loop model as a solution to the hard problem of consciousness.

Hofstadter’s adamant belief in his strange-loop model explains his disbelief in consciousness, the self and free will. If we are really strange loops, then that explanation supersedes other, more traditional views of the mind-body problem, which assume that we are these things called “selves” that possess other things called “consciousness” and “free will.”

The irony is that Hofstadter has shown that mind-body stories can take many forms. They can be works of mathematics, science, philosophy, theology or art. Or, like Gödel, Escher, Bach, they can be a chimerical blend of all the above. Hofstadter might not like what I’m going to say next. But when he calls his theory correct, he’s making a category error, like calling an Escher woodcut or Virginia Woolf novel correct.

Loop theory makes my loop thrum, perhaps because I share Hofstadter’s fascination with self-reference and a closely related concept, recursion. And I too suspect that at the bottom of everything, something is doing something to itself. Hofstadter explores a corollary theme in Surfaces and Essences: Analogy as the Fuel and Fire of Thinking, which he co-wrote with Emmanuel Sander, a French psychologist and friend. The book argues that we can never know reality, whatever that is. Our knowledge of the world consists entirely of analogies, things that resemble other things. There is no “correct” view.

Although less artful than Gödel or Loop, Surfaces fascinated me, in part because it triggered a flashback to “reading” Finnegans Wake in college. I say “reading” because I didn’t understand Finnegans Wake in any conventional sense. It is even more packed with puns and meta-meanings

than Hofstadter's work, but it moved me, the way music moves me. The narrative consists of dreams within dreams within dreams. There isn't any reality, or ground of being, it's dreams all the way down, a river of dreams, that whirls and eddies endlessly before circling back to its beginning. A strange loop indeed.

The mind-body problem coils like an ouroboros at the heart of philosophy, science, mathematics, art. Some experts, notably Hofstadter's pal Dennett, strain to explain away the problem, but Hofstadter, perhaps inadvertently, makes it more mysterious. In I Am a Strange Loop, he calls the strange loop a "closed cycle." He writes that "despite one's sense of departing ever further from one's origins, one winds up, to one's shock, exactly where one had started out." A paradigmatic strange loop is Escher's staircase, which goes up and up and up but never gets anywhere.

Jorge Luis Borges offers another example of a strange loop in his creepy fable "Borges and I." He describes how he, the real Borges, is oppressed by his authorial persona, Borges. Whatever he does, whatever he creates, the other Borges coopts it. "Thus is my life a flight, and I lose everything, and everything belongs to oblivion, or to him," "Borges" writes. "I don't know which of the two of us is writing this page." This is the nightmarish converse of Escher's drawing of two hands chummily bringing each other into existence. If Borges could draw, he might show two hands frantically trying to erase each other.

In 1981 I emerged from a psychedelic trance convinced that I had stumbled onto the secret of existence. Creation stems from—or is—God's identity crisis. Think of the responsibility! Being God! If God has free will, He could choose to kill Himself, and everything would vanish. Freaked out by His own omnipotence, and the possibility of His own death, God desperately flees from Himself, from the terror He feels contemplating his own divinity. He creates us, this whole crazy, cosmic human adventure, this eternal (we hope) golden braid, as a distraction.

Eventually I talked myself out of this delusion. I persuaded myself that the anxious God I had encountered, or become, during my trip was just a projection of my anxious self. But since meeting Hofstadter, that vision has been haunting me again. If there is a God, He must be a strange loop. It's strange loops all the way down.

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Niceness, I like to think, is my default behavior. When I'm interviewing someone, I have an extra incentive to be nice. I want subjects to like me, trust me, because they are more likely to tell me things. But often I simply like the person, and want him to like me. Sometimes I'm extra nice because I feel compassion for the subject. That's how I felt about Hofstadter by the end of my day with him. I wanted to protect him from the world, from predators like me. His voice was hoarse. He seemed exhausted, more frail than ever.

I had no more questions for him, but I wanted to say something nice before I left, so I told him his writings had inspired me to become a science writer. He seemed pleased. I added that I loved the phrase soular corona, which Hofstadter coined in Strange Loop to describe how someone's soul persists after death, and I had been moved by his story about Jim, the father of a friend, who has Alzheimer's disease. Hofstadter didn't recall the details of that passage, but now that I mentioned it, he remembered being pretty proud of it. Did I have Strange Loop with me? I dug the book out of my backpack, and Hofstadter located and read the passage:

"Even before Jim's body physically dies, his soul will have become so foggy and dim that it might as well not exist at all—the soular eclipse will be in full force—and yet despite the eclipse, his soul will still exist, in partial, low-resolution copies, scattered across the globe… Where will Jim be? Not very much anywhere, admittedly, but to some extent he will be in many places at once, and to different degrees. Though terribly reduced, he will be wherever his soular corona is. Is it very sad, but it is also beautiful. In any case, it is our only consolation."

Hofstadter looked up with a sad smile. He walked me out of the house, past the ancient golden retriever, who didn't raise his head this time. As we stopped beside my car, I wanted to hug Hofstadter, but that was out of the question. I extended my hand. Hofstadter thrust his arms out, smiling broadly, and hugged me.

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In moments of weakness, I suspect that Hofstadter is right, free will is a fiction, a story that makes the world more meaningful. After I returned from Indiana, my girlfriend, “Emily,” dragged me to an art exhibit. I vaguely recall being irritated with her, so I was sullen and silent as we waited in outside the exhibit. I forgot whatever had been bugging me as soon as we entered the room containing the exhibit.

A huge marionette, which looked like Howdy Doody, dangled from the ceiling of an enormous white room. His big blue eyes were eerily animated. They blinked and swiveled back and forth, as though scanning the crowd. He was attached by chains to a large black box affixed to the ceiling, which was in turn affixed to a rectangular track.

With a mechanical clacking, the box began moving slowly along the track, gathering in and expelling chains with a loud rattling noise. Howdy moved too, his limbs and head rising and falling as the chains fed into and out of the box. He seemed in control only of his eyes, which were, somehow, expressive. He looked alternately enraged, mischievous, sad, despairing.

I thought, Okay, I get it, we’re all in chains, we have no free will, except perhaps over our emotions. We can choose to enjoy, rage at, despair over our destiny, but we can’t alter it. Ho hum. I don’t buy it. Abruptly music blared, so loudly that it startled me, and the black box violently dashed Howdy Doody against the floor, yanked him up and hurled him down again, over and over. During this ordeal Howdy Doody looked ecstatic and anguished. I laughed at him and felt sorry for him without knowing why. Only gradually did I realize that the loudspeakers were blaring the old rhythm-and-blues classic “When A Man Loves a Woman.”

Love is the supreme, sublime human emotion and experience. And we are never so lacking in free will, so enslaved by desire, as when we are in love, and only love can break your heart, etc. So what’s the solution? Buddha said we can make ourselves immune to heartbreak by eradicating or at least detaching ourselves from desire, but that is not an option for me. Even if I could, I wouldn’t want to, because without desire we become inhuman. Hofstadter didn’t shake my faith in free will, but Howdy Doody did.

Then I rallied, reminding myself of my reasons for believing in free

will. For starters, free will underpins our ethics and morality. It forces us to take responsibility for ourselves rather than consigning our fate to our genes or a divine plan. To have free will means to have choices, and choices, freely made, are what make life meaningful. Try telling a man locked in solitary confinement or a soldier who had his legs blown off that choices are illusory. “Let’s change places,” they might respond, “since you have nothing to lose.”

Yes, my choices are constrained, by the laws of physics, my genetic inheritance, upbringing and education, the social, cultural, political, and intellectual context of my existence. Also, I didn't choose to be born into this universe, to my parents, in this nation, in this era, and I don’t choose to grow old and die. But just because my choices are limited doesn't mean they don't exist. Just because I don't have absolute freedom doesn't mean I have none. Saying free will doesn't exist because it isn't absolutely free is like saying truth doesn't exist because we can't achieve absolute, perfect knowledge.

Free-will deniers contend that all causes are ultimately physical, and that to hold otherwise puts you in the company of believers in souls, ghosts, gods and other supernatural nonsense. But our minds, while subject to physical laws, are influenced by non-physical factors, including ideas produced by other minds, that alter the trajectory of our bodies through the world. Hofstadter’s loopy ideas nudged me onto the path of science writing in the early 1980s, and they drew me to Bloomington, Indiana, in the winter of 2016. That’s reason enough for me to believe in free will.

Chapter Three

# The Child Psychologist: The Hedgehog in the Garden

By the third day of the conference, the Kiva Ballroom felt like Plato's cave. We prisoners sat in darkness as spotlighted figures on a stage projected arcane patterns on two enormous screens and jabbered about free will, neural networks, Bayes theorem, machine intelligence, panpsychism, psychedelics and telekinesis. What's real, I wondered, what's illusion? Does our desire to escape the cave just drive us deeper into darkness?

It was April 2016, and I was in Tucson, Arizona, at "The Science of Consciousness," the same meeting I attended back in 1994. Hundreds of scholars pitched theories to a thousand listeners. A disproportionate number of males had shaved heads or ponytails. The woo quotient had, if anything, surged over the past 22 years, perhaps because spirituality mogul Deepak Chopra had become a sponsor.

I tried to be open-minded, but skepticism welled up like stomach acid. Simmering in an outdoor hot tub with a quantum-consciousness enthusiast, I raised the old objection that brains are too warm to sustain effects like coherence and superposition. Bullshit, my tub-mate said, light is a quantum effect that happens at room temperature. To my annoyance, I couldn't think of a retort, probably because the hot tub was interfering with my quantum coherence.

My hopes rose for a lecture by anthropologist Terrence Deacon, whom another science writer had urged me to check out. Deacon proposed that all organisms, even bacteria, possess "sentience," the capacity to detect and distinguish themselves from the outer world. Once we figure out sentience, we can take on consciousness, which emerges when organisms become sentient of their sentience.

That seemed reasonable, but as he built upon this premise, Deacon kept introducing more neologisms. Homeodynamics, morphodynamics, teleodynamics, autogenesis and so on. I mused over how one clever coinage, like "strange loop" or "meme," can illuminate, whereas many obfuscate. Overhearing someone rave about Deacon's "fantastic" talk, I thought, Our

responses to theories of subjectivity are so subjective! And sensitive to theorists' style.

What does it say about mind-science that language matters so much? One can rank scientific fields by their dependence on rhetoric. Darwin and Einstein could be eloquent, but their theories endure because they fit the facts. We justly call them true. We still read William James and Freud because they are literary masters. To call their works true seems like a category error, akin to saying Pride and Prejudice is true. But does that mean objective analysis of the mind is impossible? Should we see all mind-body theories as works of fiction?

By the time Alison Gopnik lectured, I was desperate for something tangible, empirical, objectively true. Gopnik is a psychologist who specializes in children. While scientists like Deacon try to understand how mind evolved long ego in our ancestors, Gopnik investigates how mind unfolds in kids. Each childhood reprises, in a sense, human evolution.

In her 2009 book The Philosophical Baby: What Children's Minds Tell Us About Truth, Love, and the Meaning of Life, Gopnik rebukes the great sages of history for overlooking childhood. "You could read 2,500 years of philosophy and find almost nothing about children. A Martian who tried to figure us out by studying Earthling philosophy could easily conclude that human beings reproduce by asexual cloning."

Studying children, Gopnik argues, can illuminate deep mind-body riddles, like how we know about the world. In a chapter called "Escaping Plato's Cave," she points out that knowledge begins with sensory stimuli, such as photons impinging on our retinas and sound waves on our eardrums. From these inputs we construct accurate, predictive maps of the world. How?

Plato proposed that we are born with an intuitive knowledge of mathematical forms existing in a transcendent realm. Worldly things are imperfect manifestations of those ethereal forms. A modern incarnation of this idea holds that evolution encoded knowledge into our genes, knowledge activated by external stimuli. These approaches assume our brains deduce truth. You see something small and furry with a black nose and floppy ears, compare it to your internal models and conclude: puppy!

An alternative, Gopnik points out, would be representing the world probabilistically. Our brains toss out multiple interpretations of a given stimulus and select those that seem most probable. That is probably a puppy,

and it's probably okay to pet it. This is the Bayesian method of knowledge generation, based on a formula for calculating probabilities invented by 18th-century cleric Thomas Bayes (who used it to prove God's existence).

Bayesian models have been embraced by other psychologists specializing in learning and by computer scientists trying to build intelligent machines. Gopnik was an early adopter, in part because the models emphasize imagination, which she sees as an underappreciated human talent. Imagination allows us to envision, and become, something other than what we are. Our "capacity for change," Gopnik states, "both in our own lives and throughout history, is the most distinctive and unchanging thing about us."

When Gopnik stood before us in the Kiva Ballroom, illuminated by spotlights, I felt sympathetic stage fright, as I often do before others' talks. But she commandeered the ballroom like Caesar, a diminutive, feminine Caesar with short dark hair, sheathed in silky pants and blouse. Yanking the mike from its stand, Gopnik primed us with a barrage of questions. What is it like to be a child? A baby? Why do humans have such a long childhood? Are babies just dumb, incompetent versions of adults? Are they less conscious than adults, or even unconscious?

Babies are in some respects more conscious than adults, Gopnik said, more open to stimuli, because they have fewer filters, pre-conceptions, goals. She backed up this assertion with a graph charting the synaptic connections between brain cells. The connections surge from birth until we are seven or eight and then drop off sharply as our brains undergo "synaptic pruning."

Gopnik's research has also established that kids can be more creative than adults, better at finding "unlikely solutions" to problems. The older we get, the more our knowledge and pseudo-knowledge blind us. We are in "a box defined by our hypotheses." We search the space of possible solutions for those compatible with our pre-existing beliefs. Yeah! I thought. That's why we don't see the damn gorilla!

Gopnik distinguished between two mental modes, "explore" and "exploit." Kids are in the explore mode, absorbing information at a prodigious rate, open to anything, experimenting wildly with ideas, imagining all sorts of possibilities, even fantastical ones. From puberty on, we shift to exploit mode, in which we increasingly focus on goals like finding mates and making money. Kids are humanity's R&D department, Gopnik said, adults do manufacturing, marketing and sales.

Another metaphor: Grownup consciousness is a spotlight, kid consciousness a lantern, casting light widely. Oldsters can recapture their child-like open-mindedness with meditation, travel, romance and caffeine, which has chemicals like those abounding in kids. Being a child is like being in Paris high on love and double espressos. Psychedelics can also do the trick. “Babies and children are basically tripping all the time,” Gopnik said. I and the other old acidheads in the audience clapped and cheered.

Gopnik’s talk left me wanting to recapture the innocence of childhood, open my eyes, see the gorilla. Maybe it was time to drink ayahuasca again, or give meditation another shot. Exiting Kiva Cave into blinding sunlight, I joined a line of grownups trudging up the path to the main hotel. A boy and girl, seven or eight, descended in the opposite direction on the grass beside the path. They didn’t trudge, they ambled, sauntered, they were loosey-goosey, tipsy. As the boy passed me, he flopped forward and summersaulted the rest of the way down the slope. For an insane instant, I wondered if the boy was in cahoots with Gopnik.

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I interviewed Gopnik in Tucson in 2016 and at her home in Berkeley a year later, where I observed one of her experiments on kids. Physically petite, she has an over-sized presence. Her face seems—the word that kept coming to mind was naked. She is ebulliently unguarded. When I posed a question, she didn’t just answer it. She pounced on it, batted it around, grabbed it in her teeth, shook it back and forth. Ideas gushed out of her so fast that her speech could barely keep pace. The faster she talked, the more ideas she had. Now and then, acting as her own traffic cop, she abruptly held her hand out and fell silent for a moment before revving up again.

She was pricklier in person than on the page or stage. She compared a prominent psychologist to Professor Irwin Corey, a comedian whose shtick is spewing out pseudo-intellectual gibberish. Although fond of Buddhism, which helped her get through a rough patch, she complained that some Buddhists “treat women with complete contempt, which is part of the tradition.” She mocked old-school Darwinians for assuming that “silver-

haired, aging psychology professors should be allowed to sleep with their graduate students because that is the basic, fundamental tenet of human nature."

She often ended sentences with rising pitch, as if the interrogative mode propelled her forward. Discussing how physical systems allow for human choice, or free will, she said, "I don't think anybody has a good story about it?" and "I think there is a case to be made that it will not be reduced away?" (Gopnik has written that "uptalk" has become "a marker of status and power for this generation, rather than insecurity or uncertainty.")

Both times I spoke to Gopnik, her second husband, Alvy Ray Smith, sat nearby. A computer scientist and co-founder of Pixar, the animated-film studio, he is a big, genial man with a ruddy face and white goatee. For the most part, Smith leaned back with a doting grin, watching his wife perform. But he chimed in now and then, for example, when Gopnik talked about the upside of a midlife crisis.

One way to solve problems, she explained, is to look for solutions similar to those you have already tried. Another way is to "do a lot of random shit," she said. "Try something completely crazy." The older we get, the more we take the cautious approach, because we have become "increasingly rigid and structured." We also have more to lose. A crisis, however painful, "can shake up all that structure and order. And that enables you, if you are lucky, to come up with something on the other side that is a genuine, new, creative solution."

Annealing, a process used in materials science, provides an analogy to identity crises, Gopnik said. You heat up an alloy or other substance and let it cool into a new chemical structure with novel properties. Annealing "randomizes everything," Smith interjected. "Sometimes it comes down in a wonderful place, sometimes not."

This was not a hypothetical discussion. Around her 50th birthday, Gopnik melted down, an episode that she describes in "How an 18th-Century Philosopher Helped Solve My Midlife Crisis," published in The Atlantic in 2015. For most of her life, she had been "an exceptionally fortunate and happy woman, full of irrational exuberance and everyday joy." She was married to a "good man," with whom she had three sons. Her career brought her enormous satisfaction. She writes:

"My life's work had been to demonstrate the scientific and

philosophical importance of children, and I kept a playpen in my office long after my children had outgrown it. Children had been the center of my life and my work—the foundation of my identity. And then, suddenly, I had no idea who I was at all."

After her sons grew up and left home, her marriage collapsed. Then she discovered something surprising about herself. She was bisexual. For her entire prior life, she had been attracted to men, period. She saw herself as exclusively heterosexual right up until the moment she first had sex with a woman, with whom she fell in love. Her former identification as 100-percent straight, she realized, stemmed from "sheer stupidity and lack of experience."

Gopnik sees sexuality as much more fluid than she once did, and not only because of her personal experience. Research suggests that some people have a strong biological predisposition to heterosexuality, others to homosexuality, perhaps because of hormonal influences in utero. But "there is incredible variability in sexual attraction and identity," Gopnik told me. When male friends assure her they are completely straight, she responds, Try having a romantic relationship with an attractive man. "If you come to me and report you can't have that relationship, then I'll believe you. But now I don't think you have the data to say that."

After her lover ended their relationship, Gopnik was heart-broken. For the first time in her life, she sank into a deep depression. This novel experience, unlike her lesbian affair, was not enlightening. Depression "shuts down your experience of what is going on around you," produces a "narrowing of focus" and "flattening of affect."

Gopnik lost her passion for science, and her curiosity about the world, which had given her so much pleasure. "That sense of having a large world independent of you and your own internal concerns," she said, "is a characteristic consolation of science." She felt bereft in every possible way. She was an authority on the mind-body problem, the mystery of who we are, who didn't know who she was. "I was no longer a scientist or a philosopher or a wife or a mother or a lover," she recalls in The Atlantic.

Antidepressants didn't help, but meditation did, a little, and, perhaps more important, it rekindled her intellectual curiosity. Reading about Buddhism, she discovered correspondences with David Hume, one of her intellectual heroes. Hume was a radical skeptic, who questioned the existence of God, immortal souls, even the self. In A Treatise on Human Nature he

wrote:

"When I enter most intimately into what I call myself, I always stumble on some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never can catch myself at any time without a perception, and never can observe any thing but the perception."

This insight bears an uncanny resemblance to the Buddhist doctrine of anatta, which holds that the self is an illusion. Gopnik became obsessed with the possibility that Buddhism had inspired Hume. He wrote his Treatise while living in France near a Jesuit monastery, through which scholars acquainted with Buddhism had passed.

As Gopnik pursued her investigation of Hume's influences, her depression lifted. She had a "romantic adventure or two," straight and gay. She spent a year on sabbatical in Caltech, where she commiserated with Christof Koch, who was enduring his own midlife crisis. They talked about love and sex and the mind-body problem. Like Koch, Gopnik eventually settled into a new, happy equilibrium. In 2007 Alvy Ray Smith introduced himself after watching her give a public lecture. They married a few years later.

Life was good again. "I had found my salvation in the sheer endless curiosity of the human mind," Gopnik writes, "and the sheer endless variety of human experience." Gopnik's meltdown did not alter her core values and convictions so much as it helped her rediscover them. She had always believed in the fluidity of the self, but discovering her bisexuality transformed her belief into "a lived experience."

Gopnik's crisis also bolstered her non-supernatural spirituality. She has had "spiritual-slash-numinous experiences" throughout her life, she told me. She never dissolved into nothingness, or found herself transported to a celestial realm. But she has often felt overwhelmed with "meaning and beauty and significance" in response to music, a sunset or sleep-deprivation. These experiences weren't "transformative" in the sense of radically changing her worldview. They didn't make her believe in God or alter her philosophy in any significant way. "They were just things that were an important part of my pleasure."

And that, for Gopnik, is enough. For thousands of years, prophets and philosophers have postulated the existence of an eternal, transcendent reality that gives life meaning. But "every one of those attempts at metaphysical

transcendence crumbled," Gopnik said. Science has made it hard to believe in souls, God and heaven, leading to a collective spiritual disappointment.

Gopnik's crisis convinced her that everyday experiences, if we pay close attention, should give us all the beauty, mystery and meaning we need. "And I think that—that—genuinely, truly was a consoling insight for me." We should stop yearning for a God, an afterlife, a transcendent moral order, and make the most of this life, right here, right now. "If there isn't life after death, you ought to be paying a lot of attention to life before death. And pay attention to things going on in front of you." Things like kids.

Gopnik doesn't just explicate kids, she celebrates them. They are much more than a means of testing conjectures about consciousness, learning and creativity. She called children "the foundation of my identity." During her midlife crisis, her divorce and lesbian affair "were kind of trivial compared to not being a mother any more." Male sages, historically, have disdained caregiving as women's work, a distraction from the quest for enlightenment. The joys of parenthood are "completely invisible to most [religious] and philosophical traditions," Gopnik said, "because they are all pursued by a bunch of men."

Some women, too, avoid talking about the spiritual dimensions of having kids. "We kind of keep it quiet, because it's like an anti-feminist thing." Changing your daughter's diapers or helping her with her math homework can be a chore. But many women, and men, too, undergo a "total moral and spiritual transformation as a result of having children."

Erotic love can be spiritually profound, but the love you feel for your children is "utterly altruistic, profoundly selfless. It has all these kinds of mystical characteristics." Caring for children lends "meaning and purpose and direction and significance to life," she said, and it is "an awfully fast and efficient way to experience at least a little saintliness." Your kids even give you an afterlife of sorts. Maybe life has no transcendent meaning, but parenthood, for Gopnik, comes close.

Perhaps inevitably, she has written a book on raising kids, The Gardener and the Carpenter: What the New Science of Child Development Tells Us About the Relationship Between Parents and Children. Published in 2016, it is a kind of anti-parenting guide, and a work of almost defiant optimism. Given the enormous diversity of children, caregivers and cultures, Gopnik argues, there can be no single prescription for child-rearing. So chill,

your kids will turn out fine, and if they don't, it's probably not your fault. Rumanian orphans raised for years with virtually no human interaction thrived, usually, after they were adopted.

Don't be a carpenter, trying to construct high-achieving kids who become high-achieving adults. Be a gardener, give kids the nourishment they need to grow in their own weird, unpredictable ways. Gopnik notes that each generation "creates a slightly different world than the generation that preceded them. It's a mess. But it's a good mess, a mess that allows human beings to thrive in a staggering array of constantly changing environments." Trust your children, trust your fellow humans, everything is going to be okay.

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Gopnik embodies her own values of flexibility and open-mindedness. She does not respond to questions with pre-recorded, rote answers, as many prominent scientists do. She has an unpredictable, live mind. Although she is a master exploiter—a successful researcher and writer with set beliefs, principles, goals—part of her is always in explore mode. She is on the lookout for new ideas about children, the self, sexual identity, the acquisition of knowledge and other mind-body puzzles.

Many scientists, like Christof Koch and Douglas Hofstadter, seem compelled to attach themselves to a big idea, but Gopnik resists big ideas, whether involving God, Darwin, Buddha or Bayes. She finds Buddhism fascinating, but she isn't evangelical about it, and she doesn't like Buddhists' exaltation of celibate males, such as the Dalai Lama, as the epitome of spirituality.

She sees genetics and evolutionary biology as powerful frameworks for understanding our minds and behavior. But she accuses some Darwinians of peddling flimsy "just-so stories" about human nature and of projecting their obsessions with sex, violence and status on our ancestors. Bayesian learning, similarly, is not a theory of everything, as some advocates have suggested.

She pooh-poohs claims of artificial-intelligence enthusiasts that we are approaching a "Singularity," when computers become much smarter than

us and start pursuing their own goals. Computers are far from being autonomous or creative in any meaningful sense. “You have to have incredibly well-defined problems for them to succeed,” and they still need lots of help from humans. The gap between what computers can do and what little kids can do is “so enormous at this moment that thinking about the Singularity is just silly.”

As for consciousness, Gopnik doesn’t think it will be explained by a single model, like integrated information theory or strange loops. She compared research on consciousness today to studies of life in the 19th century. Back then scientists believed in vitalism, the idea that life stems from some mysterious force or essence. They thought “we’d find the thing that was responsible for life.” Science never did discover what “made life different from non-life,” she said. “It just didn't turn out there is a single magic feature.”

Modern scientists no longer fret over the “problem of life” because they have explained so many biological processes, such as evolution, reproduction, heredity and metabolism. “I suspect that’s going to end up happening with consciousness,” Gopnik said. Scientists will not converge on a single explanation for consciousness. “There won’t be convergence, there will be divergence. But the divergence will be a bunch of genuinely explanatory stories.”

But these scientific stories, no matter how compelling, might never entirely capture us, because we are moving targets. That is one of the key messages of Philosophical Baby. “The human capacity for change,” Gopnik asserts, “means that we can’t figure out what it is to be human just by looking at the way we are now.”

Philosopher Isaiah Berlin divided intellectuals into foxes, who know many things, and hedgehogs, who know one big thing. “Oh, I am completely a fox,” Gopnik answered when I asked her to categorize herself. Children are sort of a big idea, or obsession, but she has always been restless intellectually, as evidenced by her recent interest in Hume and Buddhism. Smith interjected that he thought of her as a fox too, and Gopnik gave him a wicked smile.

Actually, you’re a hedgehog, I told Gopnik, and here’s why. Your big idea is that there are no big ideas, at least not when it comes to the mind-body problem. The theme of diversity, creativity, imagination and change runs

through all your work. You see childhood as a time for exploring ideas, and you think adults, too, should try to be more open-minded. You dislike deterministic theories of human identity and behavior, including sexual behavior, and you like theories that emphasize variability and probability, like the Bayesian models. You're a pluralist, like Isaiah Berlin, who rejected the idea of the big idea and dwelled on the myriad ways we find to be human.

Gopnik seemed amused, and pleased, by my description of her worldview. She was a fan of Isaiah Berlin, whom she cited in Gardener and the Carpenter. But she frowned when I got to my punch-line. Your pluralistic outlook, I said, meshes nicely with my perspective of the mind-body problem: We are all entitled to choose our own solutions, which reflect our particular outlooks.

"I guess it depends what you mean by solution," she said. "We are all entitled to have guesses…." Gopnik brooded, then she played with my proposition, swatting it this way and that. She wasn't keen on the idea that "everybody gets entitled to his own opinion." We shouldn't choose theories simply because they make us feel good or reflect our values. After all, science settles some questions once and for all. "I am definitely a scientific realist? Fairly strongly?"

But "within the constraints of scientific realism," she added, "there is lots of play and opportunity." Scientists rely on imagination. They envision how the world might be, propose a theory and try to prove it false. Einstein's path to relativity began with a thought experiment about a train moving at the speed of light. "Even though that's false, working out inferences in those counterfactual situations can actually tell you something you didn't know." Science, as it progresses, rules out certain possibilities, but it keeps generating new ones, expanding our degrees of freedom.

So do the arts, in their own way. Gopnik's father, a professor who specialized in 18th century English literature, encouraged her and her five siblings to read literature. By her mid-teens Gopnik had consumed Dickens, Austen, Shakespeare, Proust. She spent more time in fictional worlds than in the real world. Eventually her tastes turned to philosophy and science, but she still loves literature, which helps us appreciate the "range of possibility" of life by getting us to "jump over into the subjective experience of another person."

After all this thinking aloud, Gopnik said she would be "happy to

serve as a representative pluralist" for my book. She does not think we will discover a single, final solution to the mystery of who we are. We will certainly never construct a utopia, not defined as a final, optimal state of human self-organization and self-fulfillment. But it might be possible to create a pluralist utopia that allows "many, many, many, many different forms of life, many ways of being in the world."

She warned, as Isaiah Berlin did, that there will always be tension between people whose values diverge. Faith will always jostle against science, freedom against equality, hedonism against virtue. Some Americans see gay rights as "destabilizing and terrifying," Gopnik said, because they value "tradition and continuity" with the past. No matter how accepting we are of each other, our pluralist utopia will always be in explore mode. It will keep growing, evolving, in unpredictable ways, which can always go awry.

"I think the garden metaphor is actually a pretty good metaphor for utopia. This," Gopnik added, spreading her arms to take in our surroundings. We were at her home in Berkeley, sitting in the backyard, a small patio ringed by lush greenery. Gopnik worked on this garden a lot during her midlife crisis. Actually, she confessed, she spent more time reading gardening books than gardening (just as she read about Buddhism more than she meditated).

The books decreed that gardens must have a theme, so she picked the theme of "decadent, falling apart, once-great aristocratic English garden going to seed." That explained the unruliness of her garden, the foxglove, clematis and fuchsia encircling us, and the tree, wrapped in climbing roses, towering over us.

Where does that fit in? I asked, pointing to a potted plant with thick, fleshy, purple leaves. It looked like it had been imported from Mars. Ah, Gopnik said, that is an Aeonium Schwarzkopf, a succulent, sometimes called a black rose. That is Alvy's contribution to the garden, and so is that, she said, pointing to a cactus that looked like a prickly, melting brain, and that, and that.

Only then did I notice all the other-worldly plants ringing the patio. Smith, who grew up in New Mexico, has always been fond of desert flora, and when he moved to Berkeley he began slipping them into the garden. "So we have my beautiful English garden and then Alvy's insane cactus and succulent garden," Gopnik said.

“That was the first test of marriage,” Smith said. “I slipped one succulent in.” The irony of Smith’s attraction to cacti, Gopnik said, is that he is “as un-spiky a person as you can possibly have.” Gopnik and Smith, sitting in the middle of their own quirky, still-evolving mini-utopia, beamed at each other.

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A journalist working on a story has to shift, at some point, from explore mode to exploit. You must choose one way to tell your story out of all the ways to tell it. Sometimes your choices feel inevitable, often they don’t. As I worked on this chapter, I kept waiting for it to anneal into its pre-ordained, Platonic form, but it remained stubbornly fluid. The kicker proved especially elusive. Kicker is journalist jargon for ending with oomph.

I considered closing with a recap of Gopnik’s pluralistic perspective on the mind-body problem, or my version of it. Shun mind-body stories that have harmful consequences or blatantly contradict well-established empirical evidence. Otherwise, let your imagination run wild.

This perspective makes sense to me, because I share it. It’s the theme of this book. There can’t be one optimal way to see ourselves, or be ourselves, whether Buddhism, Marxism or Darwinism, because we have different ideas about what counts as a meaningful life. Being a stay-at-home dad works for you. I prefer being an antiwar activist, or an investment banker snorting coke off the breasts of a hooker. And over the course of our lives we change our minds about what is meaningful. “A human being isn't just a collection of fixed traits,” Gopnik writes, “but part of an unfolding and dynamic story.” Yes, to be human means to be in explore mode. I could wrap up this celebration of pluralism with a snapshot of the hedgehog and her mate in their garden.

But that kicker felt too straight. I am fond, no doubt too fond, of oblique kickers, which undercut what I’ve just said or dart off in a new direction. Also, I needed to vent the misgivings aroused in me by Gopnik’s adoration of kids. She knows she gets a little schmaltzy. “One of the worst things about writing about the importance of children,” she writes in

Philosophical Baby, “is that practically everything you say turns out to sound like a greeting card.”

From the Darwinian perspective, it’s hard to overstate kids’ importance. I once heard Richard Dawkins, trying to spin evolution as a feel-good meme, point out that we are all descended from a long line of biological “winners,” organisms that succeeded in passing on their genes. I guess that means I should be proud to be a reproducer.

But natural selection, that old joker, programmed males to want sex, not necessarily children. I didn’t choose to be a father, really. Before we married, my wife-to-be insisted she didn’t want kids, and I said fine. A couple of years into the marriage, she changed her mind, she wanted kids, and I said fine. So much for my free will. We had a son and a daughter, one right after the other. Fatherhood didn’t come naturally to me. Male friends had assured me I would be overwhelmed with love when I held my first-born in my arms. That didn’t happen. The birth was arduous, and I was just relieved that my wife and son were okay.

Over time I became bound, as if by sinews and veins, to Mac and Skye. But when they were in their mid-teens, their mother and I split up, and I felt like I had failed them. I was grateful for Gopnik’s assurance in The Gardener and the Carpenter that my kids will probably turn out okay no matter what I do, and that it’s probably not my fault if they don’t. But her exaltation of parenthood exacerbated my feelings of guilt and inadequacy.

These emotions were roiling within me when I flew to Berkeley to interview Gopnik and observe one of her experiments. I arrived a day early, and to kill time I wandered into a funky used-book store. Looking in the horror section for something fun to read, I spotted an ancient, apparently mis-categorized paperback edition of What Maisie Knew by Henry James.

What Maisie Knew, which I finished that night, turned out to be a horror story after all, a deep dive into human folly and depravity. It tells the tale of a pre-pubescent girl abandoned by her divorced biological parents. Other adults pretend to come to Maisie’s rescue, but they just manipulate the poor waif for their own ends. What Maisie Knew demolishes the notion of selfless love, just rips it to shreds. At least I’m not as bad as Maisie’s dad, I thought. But I also recognized myself in James’s self-absorbed adults.

The next morning I met Gopnik at a daycare center for children of Berkeley employees and students. The center, where Gopnik was carrying

out an experiment with a graduate student, Adrienne Wente, was a spacious, well-lit room with an arched ceiling. Bright, splashy watercolors covered the walls, plus a poster showing Einstein and a quote: “Play is the highest form of research.”

“My heart always rises when I walk into this place,” Gopnik murmured as we entered the building. We eased onto tiny blue chairs in one corner of the room. “You cannot be pompous sitting in a chair that is much too small for you,” Gopnik whispered. Nearby, Wente and her tiny subjects sat on tiny chairs, a tiny table between them. As Gopnik gazed at the children, her fondness was palpable.

Wente tested three girls and three boys, all five years old, one at a time. Each child was different. This girl was chatty, this boy taciturn, this girl fidgety. Actually all the kids were pretty fidgety. Sitting in that chair seemed as perilous as riding a pogostick. Two kids tumbled off the chair.

The experiment probed children’s tendency toward wishful thinking. Gopnik whispered the protocol to me as Wente performed it on one child after another. Wente showed each kid 10 plastic Easter eggs, eight blue and two yellow. She put the eggs in an opaque bag, shuffled them and pulled one out, concealed in her hand. She asked the child to guess the color. Most kids guessed blue, showing they grasped basic probability.

Wente performed the same routine, except this time she put prizes--little colored stickers--in the yellow eggs. Once again she pulled an egg from the bag, concealed in her hand, and asked the child to guess the color. She said if there is a prize in the egg, the child can keep it. Rationally, the child should still guess blue, but most guessed yellow. They wanted the egg to be yellow, because they wanted the prize. Wishful thinking trumped common sense.

This tendency toward wishful thinking shows up by the time kids are four and fades when they are seven or eight. Of course wishful thinking persists in other forms, Gopnik noted. Her son was opening a restaurant. How wishful is that! Starting a business, doing research, writing a book all require wishful thinking. We are all wishful thinkers, unless we are depressed. You could define depression as the absence of wishful thinking--unless the wish for non-existence counts.

Nothing requires more wishful thinking than having children. Watching Gopnik’s colleague talking to the five-year-olds, these bundles of

pure promise, my heart ached. I thought of the scene in Annie Hall when kids in a classroom announce what they will become when they grow up. A methadone addict, a leather fetishist, head of a plumbing company. We bring kids into the world knowing they will endure disappointments, get old and die. Why? What's the point? Because it is our biological imperative. The purpose of life is making more life.

Gopnik acknowledged that the compulsion to have kids isn't exactly rational. "I can rationalize it in the context of evolution," she said of parenthood, "but you certainly can't rationalize in the context of your everyday conception" of happiness. The more you love your child, the worse you feel when she leaves to live her own life. Gopnik was devastated when her kids went to college, and that is a happy parting, a best-case scenario. As I began this book, a couple I know lost their son to a drug overdose. He had been one of my son's best friends. I had played tennis with the boy and his dad.

After I flew home from Berkeley, I vaguely recalled that Siddhartha, Hermann Hesse's fable about the quest for enlightenment, explores the pain of parenthood. I dug up and re-read my decrepit paperback copy, which I have had since my teens. Born a prince, Siddhartha rejects that life and becomes a monk, abandons that life for one of worldly pleasures and finally, in his dotage, becomes a ferryman.

His simple, serene life is disrupted when a teenage boy shows up. He is Govinda, the child of Siddhartha and his long-lost lover Kamala, who has died. The more Siddhartha tries to love Govinda, the more the boy scorns him. When Govinda runs away, after stealing money from him, Siddhartha's heart breaks. But staring at the river, he remembers how he broke his father's heart by running away from home, and he has a vision:

"The image of his father, his own image, the image of his son merged, Kamala's image also appeared and was dispersed, and the image of Govinda, and other images, and they merged with each other, turned all into the river, headed all, being the river, for the goal, longing, desiring, suffering, and the river's voice sounded full of yearning, full of burning woe, full of unsatisfiable desire. For the goal, the river was heading, Siddhartha saw it hurrying, the river, which consisted of him and his loved ones and of all people he had ever seen, all of these waves and waters were hurrying, suffering, towards goals, many goals, the waterfall, the lake, the rapids, the

sea, and all goals were reached, and every goal was followed by a new one, and the water turned into vapor and rose to the sky, turned into rain and poured down from the sky, turned into a source, a stream, a river, headed forward once again, flowed on once again."

Talk about going meta. When I first read Siddhartha, I was desperate to escape the cave, to feel the mystical bliss that Siddhartha felt. Now that I'm a father, nirvana has lost its appeal. Enlightenment supposedly insulates you from the pain and peril of earthly love, but I don't want to see my kids as ephemeral manifestations of the eternal wheel of death and rebirth. I don't want to be so meta that they can't break my heart. Not that I have a choice.

In The Gardener Gopnik writes, "The dance through time between parents and children, the past and the future, is a deep part of human nature, perhaps the deepest part. It has its tragic side." I can't regret having children any more than I can regret my own existence. But I understand why some of my friends chose not to have kids, and why Buddhism says being a celibate monk is your best chance for enduring happiness.

I even understand why that old bastard Socrates, before drinking the hemlock juice, ordered his distraught wife and son out of his prison cell. He wanted to lay some final wisdom on his buddies, and the woman and boy were distracting him. Families can be a drag. Not all of us have the wherewithal to chase truth and cherish our families with equal fervor, as Gopnik does.

A final nit. I wish Gopnik's pluralism were a little more accommodating. We should resist supernatural beliefs, she argues, and savor "the sheer endless variety of human experience." I share her skeptical outlook, but she and I have been quite fortunate, in spite of a few glitches, and we even get the cathartic pleasure of writing about the glitches. I can't fault others who, to ease their pain, take comfort in a woo belief or two.

# Chapter Four
# The Complexologist: Tragedy and Telepathy

When I was six or seven, I was still a devout Catholic, and I believed in the power of prayer. At a class bowling party, when my turn came I silently said a Hail Mary, hoping the mother of God would help me throw strikes. She didn't come through. Nor did Jesus, to whom I appealed in a snowball fight with older boys, keep me from being smacked in the face so hard by an iceball that I started bawling.

These disappointments contributed to my loss of faith, but I continued paranormal experiments in a secular vein well into my teens. I passed the time in dull school assemblies by telepathically commanding classmates in front of me to scratch their ears. Never worked. I could have been commanding them not to scratch.

I had better luck when I was 17 and carried out a card-reading experiment with Chris, a friend who had read a book by parapsychologist J.B. Rhine. Chris used the five cards that Rhine employed in experiments demonstrating extrasensory perception, or ESP. Each displayed a different symbol. Square, circle, cross, five-pointed star, three wavy lines.

I stared at the cards and Chris tried to guess them. After he guessed the first nine cards correctly, I started giggling, and Chris did too. Then he couldn't guess correctly any more. Or so I remember. We were probably smoking weed. I called Chris while working on this chapter, and he said his memory of the incident was similar, although he couldn't recall exactly how many cards he guessed correctly.

Another anomalous experience: In the mid-1980s I was sipping mint juleps in the living room of an old farmhouse in Maine with two women, India, the house's owner, and her roommate Suzie, whom I married several years later. There was a strange noise, and we stopped talking to listen. It sounded like a woman crying upstairs. India and Suzie said it was a ghost, whom they had heard before. That incident and the card-reading episode remain inexplicable to me.

After I became a professional science journalist, my interest in the

paranormal, or psi, faded as I delved into more scientifically acceptable mysteries. I decided that ghosts, telepathy and telekinesis are woo. My skepticism is not strictly rational—that is, based entirely on objective, empirical analysis. Like, say, sexual faithfulness, skepticism has become a fundamental part of my identity, personal and professional. A choice.

I'm proud of my skepticism, but a little ambivalent, too, because it is based in part on cowardice (again, like sexual faithfulness). I fear if I become too open-minded toward the paranormal, I might harm my image as a science writer, such as it is, and my self-image. I might forget who I really am. But in part because of my modest anomalous experiences, I've never achieved 100-percent certainty that the paranormal does not exist.

When I was writing a book on mysticism in 2000, the topic of psi kept popping up, and I dealt with it by devoting a chapter to British psychologist Sue Blackmore. Blackmore, after a spectacular, drug-induced out-of-body experience in college, believed in and tried to find evidence for astral projection and other manifestations of psi. But after many years she concluded that most of the evidence stemmed from confirmation bias or fraud. I liked and trusted Blackmore, so I believed her. I also wanted to believe her.

In 2004 physicist Freeman Dyson, who possesses one of the truly great minds I have encountered, proposed in The New York Review of Books that "paranormal phenomena are real but lie outside the limits of science." Scientists have had a hard time producing empirical proof of psi, he conjectured, because it tends to occur under conditions of "strong emotion and stress," which are "inherently incompatible with controlled scientific procedures."

Dyson even offered an explanation for what Rhine called the "decline effect," the tendency of subjects to show less telepathy over time. "In a typical card-guessing experiment," Dyson wrote, "the participants may begin the session in a high state of excitement and record a few high scores, but as the hours pass, and boredom replaces excitement, the scores decline."

In 2007 I ran into Dyson at a scientific conference in Europe, and he affirmed his belief in psi. We happened to have this exchange while sitting at a table with seven or eight scientists. Soon, everyone started swapping stories about paranormal experiences. Surprised, I asked who, at the table, thought paranormal effects might be real. All, as I recall, raised their hands. None,

other than Dyson and Wolf Singer, a German neuroscientist, had publicly revealed their open-mindedness. They worried that disclosure might harm their careers.

My skepticism wobbled again in 2014 when I met Rupert Sheldrake at a conference in England. Sheldrake, who earned a Ph.D. in biology at Cambridge, is a leading parapsychologist, renowned, or notorious, for claiming that humans, dogs and other animals have extrasensory perception. Sheldrake and I hit it off. He was smart, knowledgeable, funny, passionate about his research without being fanatical. He told me that scientists constantly confess, privately, that they keep their belief in the paranormal secret for fear of damaging their reputations. These are some of the reasons why I have devoted a chapter to the strange, tragic case of Stuart Kauffman.

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Kauffman, who was born in 1939, has had multiple professional identities. He studied philosophy at Oxford, switched to medicine and earned an M.D., left medicine to do genetic research, earned several patents, became a biotechnology entrepreneur and even a business consultant. He is best known as a theoretical biologist, who claims that conventional materialist science cannot account for life and consciousness. He is one of the most intrepid mind-body theorists I know.

In early encounters, Kauffman aroused mixed feelings in me. I first talked to him over the phone in 1991 for an article on the origin of life. Kauffman had attracted attention for proposing that life emerged from a generic process called auto-catalysis, in which simple chemical compounds combine to form more complex structures capable of replication, mutation, evolution. I quoted Kauffman saying of his theory, “I’m sure I’m right,” a statement for which he apparently took some heat.

I interviewed him face to face three years later at the Santa Fe Institute for Complex Systems, then one of the hippest places, intellectually, on the planet. People at the small but high-powered think tank were at the forefront of a field called complexity. They were creating a new science that could explain hideously complex things better than conventional reductionist

methods. Armed with powerful new computers and mathematics, they were seeking general principles underpinning cells, immune systems, brains, nations, global economies…

Ugh. Even now, after all these years, when I describe the field of complexity, I feel like I'm writing an advertorial, the kind of crap that publishers put on book jackets, or that academic departments paste on their websites to impress students, parents and funders. I feel like I'm tapping the part of my brain dedicated not to genuine expression but to bullshit.

At any rate, Kauffman was a star of the Santa Fe Institute, along with Nobel-winning physicists Murray Gell-Mann and Phil Anderson. Kauffman was a theoretician of everything, a seeker of answers to Big Questions. How did order arise in the cosmos, the order manifest in stars and galaxies, cells and cities? How did life arise, and not just bacteria and jellyfish but conscious, intelligent creatures that can question and alter their destinies? Kauffman was dissatisfied with science's answers to these questions. He proposed the existence of a new creative force or law or something that counteracts entropy, the universal tendency of things to fall apart.

In 1994, while I was visiting the Santa Fe Institute, Kauffman described the theme of his new book, At Home in the Universe, with messianic fervor. The book explained how life could have emerged from generic processes that countered the drift toward heat death decreed by the second law of thermodynamics. Here is a sampling of what Kauffman said over dinner:

"Here you have a body of models that says the emergence of life might be a natural phenomenon, in the sense that, given a sufficiently complicated set of reacting molecules, you'd expect to crystalize autocatalytic subsets. So if that view is right, as I told you with abundant enthusiasm a couple of years ago [big smile] then we're not incredibly improbable accidents. It didn't take something that was utterly, bizarrely mysterious and improbable to make a self-reproducing system. It pops up out of the laws of chance and number as expected, okay? It's self-organized. Now one doesn't know despite my enthusiasm that my view is right. But suppose for the moment that it is, and suppose you could test it. Then genesis of life is to be expected, and therefore we are at home in the universe in a different way than we would be if life were this incredibly improbable event that happened on one planet and one planet only."

I emphasize “we are at home in the universe” for reasons that will become apparent later. At the time of our meeting, I was writing a book about how science would produce no more discoveries as profound as natural selection, relativity, quantum mechanics, the genetic code. If Kauffman was right about his theory, I was wrong. That was one strike against him.

The other was that Kauffman, while undoubtedly brilliant, seemed too taken with his brilliance. Too charming, clever, self-confident. I didn’t trust him. His riffs seemed intended to impress more than illuminate. He was trying to dazzle me, even bully me, with the sheer force of his intellect and personality. I wanted to puncture that self-regard.

So when I wrote about Kauffman—first in an article for Scientific American, “From Complexity to Perplexity,” and then in The End of Science—I was hard on him and his ideas, as I was on complexity researchers in general. I accused them of peddling “ironic science.” Ironic science is more akin to philosophy or even literature than to genuine science, because it cannot be empirically verified or falsified.

I always felt a little guilty about roughing up Kauffman, for two reasons. First, I thought his critique of science was profound. He was right that conventional science has not really explained the emergence of life and consciousness. Also, there was a side of him that I didn’t capture in my writing. He exuded a faint aura of melancholy. I occasionally noticed him brooding, contemplating some inner darkness. A colleague at the Santa Fe Institute told me that his daughter had died tragically. I never asked Kauffman about it, because his personal life had nothing to do with his intellectual life. So I thought.

Here is what changed my view of Kauffman. In 2015 Richard Kroehling, a filmmaker and friend, showed me a documentary he had made about Kauffman. In the film Kauffman talked movingly about how his wife of 46 years, Liz, had just succumbed to pancreatic cancer. Kauffman also recalled the death of his teenage daughter, Merit, in 1986. He had a vision of his daughter’s death a month before it happened, and he had been trying to understand this paranormal incident ever since. Eventually, to explain what happened, he invented a radical new solution to the mind-body problem.

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Early in 2016 I contacted Kauffman and asked if he would talk to me about his personal life, as well as his mind-body ideas. It turned out we were both going to “The Science Of Consciousness” in Tucson. Kauffman, like Alison Gopnik, was scheduled to give a keynote lecture. We met one cool morning on an outdoor patio at the conference center. Kauffman has a magnificent face, with full, sensual lips and heavy-lidded eyes. He looks like a fallen prophet. He speaks with supreme, sonorous confidence, dialing up the intensity and precision of his enunciation when imparting difficult concepts, as if to make imprint them on your brain.

I had seen him a couple of times in the intervening years, and he didn't seem to harbor grudges about my previous treatment of him. But after we sat down at an umbrella-canopied table, Kauffman kidded me about my ad hominem descriptions in The End of Science. “Everybody who agreed with you,” he recalled, “was normal physiologically, and everybody who disagreed with you had something like snot dribbling from his nose or was a hunchback.”

He sighed. “You nailed me,” he continued. “You got me saying your name too often, and you're right!” In The End of Science, I had compared Kauffman’s habit of repeating my first name to that of a salesman trying to establish a bond with a potential customer. Surely you realize you’re a natural salesman, I said. “Yeah, I guess I am,” he replied. “Look at my last name, Kauffman. It means merchant or something like that.” He seemed amused and annoyed.

After getting that off his chest, Kauffman told me about the life and death of his daughter. “I may have loved Merit more than anybody I ever loved,” he said. She was born in 1972, when Kauffman was at the University of Chicago. He delivered his daughter himself. “I was the first to touch my little girl,” he said. “Like catching a football. You just go, Foop!... I fell in love with her instantaneously.”

In the summer of 1986, Kauffman, then teaching and doing research at the University of Pennsylvania, took Merit to France and England for two weeks, and they had a splendid time. In Oxford, where Kauffman had studied philosophy, they bicycled, punted and drank shandies, a blend of beer and

lemonade. Everyone they met in Europe “fell in love with” Merit, Kauffman said. “There was a picture taken about three months before she died, in Paris. Beautiful picture. She looked 18. People said, ‘How old is she? She looks 18.’ I had to say, ‘No, she’s 13.’” Kauffman sighed again. “Merit was an old soul,” he said. “Maybe I had too much faith in her.”

When they returned home, Merit became troubled. A “good girl” and straight-A student, she started getting bad grades and becoming rebellious. She “went from absolutely solid to being in turmoil.” Merit might have been upset that the family was moving soon to Santa Fe, and that her older brother, to whom she was close, was going to a boarding school in Colorado.

“She seemed to be in some emotional difficulty,” Kauffman said, “but John, we didn't know it. It came on very fast.” Merit started dating a boy her age. “Of course I didn't want her to,” Kauffman said. “There was no way I was going to stop her. Things were flooding through her body near the onset of adolescence.”

A month before Merit died, Kauffman picked her up at her boyfriend’s home, which was five miles from the Kauffman home in Bryn Mawr, Pennsylvania. Merit said she wanted to walk home, but Kauffman insisted that he drive her. Night had fallen. They were driving down a street, passing a tree, when an image, like a snippet of film, flashed into Kauffman’s mind. Merit was walking down the middle of the street, her back to oncoming traffic, when a car struck her.

“I was staggered, just blown away,” Kauffman said of his vision. He didn’t mention it to Merit, but he made her promise she would never walk home from the boyfriend’s house. She would always call him for a ride. Merit, after a moment of silence, replied that she would walk as far as a restaurant near her boyfriend’s house, where she would call her father so he could pick her up. “I thought, ‘Well that’s a pretty fair compromise.’ So I said, ‘Fine, Merit,’ and we went home.”

A month later, on October 25, 1986, Kauffman and Liz were at the wedding of an acquaintance. They reconstructed what happened to Merit from conversations with her boyfriend, his parents and others. “We were very gentle” with the boyfriend, Kauffman said. “We never blamed him, because he was going to carry enough trauma.”

Merit’s older brother dropped her off at the boyfriend’s house. He and Merit drank some wine, and then he told Merit he was breaking up with her

because he had a new girlfriend. He asked Merit for money so he could take a taxi to the new girlfriend's house. Merit left the house and started walking home. She set her purse down at the side of the road. Then she lay down in the road, her head toward the middle, her face turned toward oncoming traffic. She was in the same spot where Kauffman had had his vision of her being hit by a car a month earlier.

Three drivers later reported seeing Merit lying in the road. One was an anesthesiologist at the University of Pennsylvania Medical School, where Kauffman worked. The anesthesiologist was with his wife, who was nine months pregnant. He didn't stop, because it was a few days before Halloween, and he feared the girl in the road might be playing a trick. If he slowed down, her friends might throw eggs at his car. He drove to a police station and reported what he had seen.

Police rushed to where the anesthesiologist reported seeing Merit. It was too late. "A car had come from the other lane, going the other way, not in the lane Merit was in, going too fast," Kauffman said. "He slammed on the brakes, tire marks all over the place, skidded into Merit's lane, hit her and crushed her brain stem."

Kauffman and his wife knew none of this when they returned home from the wedding party. They arrived just as their son was rushing out the door, screaming that Merit was at the hospital. By the time they arrived, Merit had been declared dead. The hospital staff led them into a room, in which Merit was lying on a gurney. Kauffman kissed her goodbye.

Recounting this scene, Kauffman was somber but calm. Around us, waiters bustled, diners gobbled food and chattered, forks clinked against plates. I felt a surge of anger. I wanted to jump up and scream at everyone to shut up, but Kauffman seemed unperturbed.

After they drove home from the hospital, Kauffman, his wife and son spent the night huddled together in bed. The next morning, they discovered a drawing in Merit's room. It depicted The Grateful Dead, the rock band, and an image of a girl lying in a road. "Somewhere in her she had that image in her own mind," Kauffman said. "I don't know. All I know is what I'm telling you."

At some point, Kauffman told Liz and his son about his vision of Merit being hit by a car. Liz didn't want her husband to share details of his vision or of Merit's death with anyone outside the family. Kauffman only

started talking about these events after Liz died in 2013.

Liz “was ashamed that Merit had lain down in the road, because there are suicidal components to it,” Kauffman explained. It was possible, he thought, that Merit did not really want to die. Her act might have been a “desperate attempt for attention” that went awry. She might have been hoping that her boyfriend would see her when he took a cab to his new girlfriend’s house.

The day after Merit died, Kauffman had another “anomalous” experience. He called Linda, a childhood friend who lived in Denver, to tell her what had happened. Linda said she had dreamed about him the previous night. In the dream Kauffman was sitting on the floor, in agony, while Liz embraced him. Kauffman had not spoken to Linda for eight months.

Let me be clear. Kauffman is describing two paranormal incidents. The first was his vision of Merit walking down the road and being hit by a car, which occurred a month before she died at the same spot. The second was the dream of his friend Linda about him and Liz on the night of Merit’s death. These incidents cannot be accounted for by mainstream —science, unless of course you assume that they are just coincidences, or that they didn’t really happen.

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Before Merit’s death, Kauffman was a conventional “atheist reductionist.” He knew about research on extra-sensory perception, but he thought “all of that was just bullshit.” Sure, various researchers, notably Rhine, claimed to have produced evidence of ESP, but others had difficulty replicating these experiments.

After Merit’s death, Kauffman could not explain away his experiences. “The specificity of my vision, and Linda’s telephone call the next day, I could not account for, and I still can’t,” he said. “From that moment on, I was open to telepathy.” Most scientists consider telepathy to be “utterly fringe,” but “what if it’s true? Then it changes everything.”

He entertained two possible explanations of his vision of Merit being run over. One is that it was precognition, seeing the future. Because he has a

hard time accounting for precognition (for reasons I'll return to later), Kauffman favors the second explanation, that he was telepathically picking up Merit's own thoughts about what she might do.

After Merit's death, Kauffman became intrigued by arguments of physicist Roger Penrose that consciousness cannot spring from purely deterministic processes, in which causes have specific, predictable effects. Penrose's reasoning was complex. It included an appeal to Godel's incompleteness theorem, which delineates the limits of rule-based systems such as those employed in conventional computers. Consciousness, Penrose concluded, must arise from probabilistic quantum effects.

Kauffman began to suspect that quantum mechanics could account for not only ordinary consciousness but also telepathy. According to one interpretation of quantum theory, a particle such as an electron or photon exists in a blur of probable, "superposed" states until it is observed, when it snaps into a single state. Particles can also influence each other through an effect called entanglement, or nonlocality. Measure the spin of an electron in New York and you instantly determine the spin of its entangled twin in Paris. In the 1930s Einstein derided this hypothetical effect as "spooky action at a distance." If quantum mechanics predicts this impossible effect, he argued, the theory must flawed and in need of revision. Einstein turned out to be wrong. In the 1980s, laboratory experiments conclusively demonstrated nonlocality.

In recent years, Kauffman has become more convinced that telepathy is real, and that it is a quantum phenomenon, for several reasons. First, Dean Radin, a former engineer at Bell Laboratories, has reported finding evidence for telepathy and telekinesis in multiple experiments over the past couple of decades. Second, several groups have found signs of quantum effects in neural information processing. These data are tentative, and contested, but they have helped Kauffman explain the anomalous events he experienced in 1986. "If mind is partially quantum, then, by nonlocality, Linda could have had her experience of me in her dream, and I could have picked up something from Merit."

Back to precognition, the other possible explanation for his vision of Merit's death. Kauffman couldn't rule out the possibility that he had glimpsed the future rather than simply reading Merit's mind. "There are enough examples of precognition that, again, you've got to take it seriously."

Precognition is consistent with classical, pre-quantum physics, which implies that the future, in a sense, already exists. Kauffman notes that the concept of a mathematical description of all that has been and will be dates back to the ancient Greeks. He calls it “the Pythagorean dream.” Einstein’s theory of general relativity also holds that all events past and future exist eternally in the four-dimensional structure of spacetime.

But Kauffman doubts that his vision of Merit’s death was precognition, for two reasons. First, the vision wasn’t entirely accurate. He saw Merit struck by a car as she walked down a road, when in reality she was struck while lying down. Second, Kauffman’s ideas about time have gotten complicated, in part because of the influence of physicist Lee Smolin.

Smolin has devoted himself to solving one of the great puzzles of modern physics, the apparent inconsistency between general relativity, which describes gravity, and quantum mechanics, which describes electromagnetism and the nuclear forces.

The theories are written in two entirely different mathematical languages. For more than a half-century, physicists have tried finding a unified theory that accounts for all the forces. Smolin is a co-inventor of loop-space theory, which takes a step toward a unified theory by reformulating gravity in quantum terms. Loop-space theory posits that spacetime, rather than being smooth, consists of loops, forming a kind of four-dimensional chain mail. Spacetime, because it is quantized, also exists in a probabilistic haze until we measure it.

Inspired by these ideas, Kauffman, together with Smolin, conjectured that reality is fundamentally unpredictable and creative. “Einstein starts with a pre-stated configuration space, a block universe,” Kauffman said. “What if that's not how it happens? What if, from loop quantum gravity, the universe builds itself, but you can’t say what it’s going to build until it builds itself?” The universe “is not an is. It’s a becoming.” Kauffman constructed a non-deterministic metaphysics based not on probability—the key concept of quantum mechanics—but on possibility. The switch makes causation looser, allowing for more wriggle room. Causation becomes akin to enablement.

This view has dramatic implications for the life sciences. It means that no theory, no matter how powerful, could predict the emergence of life and multi-cellular organisms, let alone humans. “Nobody could have said giraffes three billion years ago,” Kauffman said. Ordinarily scientists postulate a law,

predict consequences and carry out tests of the prediction. “Well, you can’t predict what’s going to happen in evolution, so you can’t falsify your prediction or verify it,” Kauffman said. “So no law for what’s out there. There is no law! It blows my mind away.”

As if on cue, birds started chirping madly in a cluster of bushes bordering the patio. Why? Was a hawk menacing them? Were they expressing fear or joy? What was going on in their bird world? Meanwhile, Kauffman kept talking. He knew about my fondness for free will, so he pointed out that his worldview easily accommodates it. “The only way to get that ontological requirement for free will is through quantum mechanics, that we know of. I mean, you could just posit indeterminism, but we have quantum mechanics. Why not use it?”

Kauffman pointed out that I could take advantage of my free will right now. I could stay here and listen to him. Or I could be thinking that he’s a nut and plotting to ditch him by pretending I needed to take a leak. That means there are two possible future moments. “You could be sitting here, or you could be on your way to the bathroom, right?” Free will “demands that the present could have been different. I don’t think this is well noticed, but it’s obviously true. You can’t have it in a deterministic universe. So that's a counterfactual. You could have been on your way to the bathroom, but you’re not, you’re sitting here. Ha ha. Dumb bunny.”

Free will isn’t absolute, of course, because that would lead to nonsensical implications. “Suppose I said to you, ‘John, you can do anything you want!’ What are you going to do? Feel it come into you. ‘I can do anything I want.’ Does that mean I am going to rocket to Mars? Does it mean I am going to go pee? Am I going to sit here and meditate? Am I going to shoot my hands off in different directions into space? What does it mean to say you can do anything? It’s totally unformulated, because there are no constraints. You need constraints to enable action.”

Our first step toward making the possible real is to imagine it. The causal power of imagination “is nowhere in physics,” Kauffman pointed out. “Well, screw physics, they better get their heads out of their equations.” Our imaginations constantly create, or enable, new possibilities. This is the premise of improvisational comedy, Kauffman said. If we were doing a skit, he might pretend to give me “a steaming platter of horseshit,” and I would imagine a response that keeps the skit going, like demanding a spoon with

which to eat the horseshit. “We enable one another. That’s not in our physics either. We’re doing it with one another right now.”

This view has much in common with physicist John Wheeler’s notion of the “participatory universe,” which was also inspired by quantum mechanics. The questions we ask about reality, Wheeler proposed, help create it. Every question provokes different possible answers, which in turn provoke new questions. “The becoming of the universe is a bunch of quantum enigmas,” Kauffman said. “And the question is, is it only we human beings that can do this, or is everything doing it? My bet is, it’s all over the place.” The entire universe seethes with creative possibilities.

Let’s return now to Kauffman’s vision of Merit’s death a month before it happened. His metaphysics suggests that he could not have been glimpsing her actual future, because it wasn’t pre-determined. It was just one of many possibilities. When Kauffman saw his daughter walking down a road and being struck by a car, he was reading her mind, as she imagined a possible future for herself. We tend to see imagination as a positive force, but it can lead to dark places, and even to our destruction.

When I asked if the paranormal experiences related to Merit’s death were in any way consoling, Kauffman shook his head. Then he brooded, casting back. A week after Merit died, Liz thought she saw lights twinkling in a bedroom, as if Merit’s spirit was present. “That was kind of consoling,” Kauffman said.

I pressed the issue. I wanted to know what purpose Kauffman’s theory served. Did his expansive view of how minds and the rest of nature work make it easier to deal with his losses? “No, no.” He just wanted to know how the world works. His feelings were irrelevant. When I asked if he was happy, Kauffman shook his head again. “I’ve gone through too much loss.” He was still struggling with Liz’s death. Around the time she died, gigs at universities in Vermont and Finland ended.

But new possibilities have unfolded. He fell in love and married again. He embarked on several new writing projects, including a play and screenplay as well as books setting forth his ideas. He was repairing his relationship with his son. “I’m slowly reinventing myself,” he said. “It’s not easy. It’s really hard.”

You seem happy, I said, and I meant it. “I have accomplished a lot of stuff that I am glad I accomplished,” Kauffman said. He was proud of fruit

fly experiments he had done as a young man, and of some of his scientific and philosophical ideas. He felt “battered” by life, and he didn’t feel any wiser now than when he was in his 20s, but he had learned to take things in stride. “You start laughing a little bit.”

Providing this self-assessment, Kauffman looked somber. But his face lit up when he told me about a recent paper, which he titled “Cosmic Mind?” “Big question mark,” he emphasized, referring to the title. Quantum mechanics, the paper conjectures, could allow for the possibility of “disembodied” minds. “Entangled quantum variables,” Kauffman writes, “may conceivably share some form of consciousness and free will, whether embodied in us, or living forms elsewhere in the universe, or disembodied; hence, something like cosmic mind or minds are not ruled out. If true, life anywhere in the universe will have evolved with mind and free will. Souls are not impossible.”

Kauffman’s essay also contemplates the possibility of a cosmic mind —that is, God—pervading the cosmos. I asked how he dealt with the old theological conundrum, the problem of evil. If God loves us, why is life often so painful and unfair? Why do innocent people suffer? Kauffman said his God, if He exists, is the cool, impersonal deity of Spinoza, not the emotionally volatile tyrant of the Old Testament.

In spite of his dalliance with the paranormal, Kauffman has a hard-headed view of human nature. As a Jew, he is all too aware of the human capacity for cruelty, but he does not believe in good or evil as supernatural forces. Natural selection, he pointed out, has shaped our behavioral tendencies, good and bad. “Our facial expressions and body language and all that is not that different from the other higher apes,” he said.

Aggression is encoded in our genes, but over the past 10,000 years, humans pursuing self-interest have invented more and more win-win, non-zero-sum ways of interacting with each other, which have enriched our lives in countless ways. Competition “isn’t such a bad thing,” Kauffman said, “as long as it’s nonviolent.” Kauffman was trying to imagine where human civilization is headed, and where it should head. What are the possibilities? “I hope it stays diverse. I hope it creates new ways of being human. I hope it has a lot of tolerance in it.”

By the end of my breakfast with Kauffman, we weren’t merely tolerating each other. We were pleased with each other and with ourselves.

My view of Kauffman had swerved. In the mid-1990s, I saw him as a smart, ambitious guy trying to achieve fame and glory by peddling bullshit wrapped in glittery rhetoric. Actually, he was a man struggling heroically to see the cosmos as meaningful and magical after fate dealt him a terrible, terrible blow. Most people, after losing a child as Kauffman did, would be forgiven for thinking that the cosmos is uncaring, if not cruel. It doesn't give a shit about us. Kauffman rejects that bitter conclusion. He insists that this is our home. We are meant to be here.

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The phrase "God of the gaps" suggests that faith will endure as long as mysteries like the origin of the universe and life remain unsolved. The implication is that freedom of belief is proportional to ignorance. In the case of the mind-body problem, our ignorance is an abyss, not a gap. So how free should we be? Free to believe in panpsychism? Souls? Ghosts? Heaven, reincarnation, nirvana? The God of The Bible? Of Spinoza? Where should we draw the line between credible and incredible mind-body stories?

Scientists who disdain paranormal hypotheses are open-minded about other data-poor claims. Examples: Reality is made of infinitesimal strings wriggling in 10 dimensions. Our universe is just one of an infinite number of universes. Our reality is actually a Matrix-style simulation created by super-intelligent aliens. Why do many scientists take these claims seriously but consider extrasensory perception beyond the pale? Take Christof Koch. When I told him I planned to devote a chapter of this book to someone who had paranormal experiences, he was displeased. Your book won't be taken seriously, he warned, if it treats a "fringe" topic like parapsychology credulously. Come on! I said to Koch. You believe in panpsychism!

My point was that if I included Koch and excluded someone who believed in telepathy, I'd be applying an unfair double standard. And actually Kauffman's worldview resembles that of Koch. Both see consciousness as intrinsic to the cosmos. Both are fans of Spinoza, who equated God with the impersonal order of the cosmos. Koch would probably agree with Kauffman that "we're at home in the universe." Kauffman's emphasis on imagination

and possibility also evokes that of Alison Gopnik.

I admire Kauffman's attempts to fuse science and spirituality. I once asked him about attacks on religion by Richard Dawkins and other "New Atheists." Kauffman replied that "to dismiss those who do believe in God, in any sense, is arrogant and useless and divisive." I agree. It is also "arrogant and useless and divisive" to dismiss those who, like Kauffman, are open-minded about extrasensory perception, telekinesis and other paranormal phenomena.

My views of telepathy are variable, unstable, entangled with my views of God, free will and the decency of humanity. My beliefs exist in a superposition of states, which can collapse when exposed to the force field of others' convictions. They can shift wildly over the course of a single day, especially when I am subject to strong emotion and stress.

The day after my breakfast with Kauffman, I watched him lecture before a packed auditorium. He laid out his quantum-consciousness hypothesis, including the implications for extrasensory perception, smoothly, without slides or notes. Part of me was impressed. Another part worried that his presentation was too smooth, polished, slick, lacking in self-criticism.

Later that same day, I had to give a talk of my own. I had persuaded Stuart Hameroff, an anesthesiologist who had been organizing these meetings in Tucson since 1994, to allot me 25 minutes in a small room during a concurrent session, which took place at the same time as other sessions. In my writings I had mocked Hameroff for his aggressive promotion of quantum theories of consciousness. He hadn't been eager to let me speak, but I wore him down.

Now I was dreading giving the talk. A dozen years of teaching has eased but not eliminated my life-long stage fright. Flipping through the conference schedule, looking for something to distract me, I experienced mild synchronicity when I discovered that Stephen Laberge was speaking. He is an authority on lucid dreams, during which you become aware that you are dreaming. In the 1970s Laberge showed that lucid dreamers could communicate with the outside world by moving their eyes, which unlike most other body parts are not immobilized in REM sleep.

In 1994 I spent several days with LaBerge in California while researching an article about him.

I had had lucid dreams as a youth, and I tried to have more while

working on my article about LaBerge, so I could supplement my objective reporting with first-person color. I went to bed thinking about lucid dreams, and I kept a dream journal. I fell asleep in his lab while hooked up to an electroencephalograph.

I didn't have any lucid dreams in LaBerge's lab or on my own, but my waking life became dreamier. I kept asking myself, as LaBerge recommended, Is this a dream? The more you ask this question when you're awake, the more likely you are to ask it when you're dreaming and to realize: Hey! This is a dream!

I slipped into Salon E, which was packed, just as LaBerge began speaking. He was lean and fit-looking, with bristly white hair. Telling us about his research, and about how we can induce lucid dreams, he was funny, interesting, lucid. I felt good that the years had been kind to him. I said hello after his talk, and we swapped reminiscences. I walked away feeling a frisson of derealization. I idly thought, Is this a dream? To psychiatrists, derealization is a disorder, a delusion, but according to certain mystical doctrines, enlightenment is the realization that your normal, waking life is unreal, a dream. Decades ago, I emerged from a psychedelic trip convinced that this world is the dream of a neurotic god.

These memories roiled my brain as I entered Salon L, where I was scheduled to speak. Kauffman was in the audience, as was Hameroff. The speaker before me, Hedda Morch, pondered whether individual human minds can merge into a meta-mind, as implied by integrated information theory. She noted that several prominent philosophers have explored the concept of "combined consciousness," including Charles Hartshorne.

Synchronicity strikes again! I had stumbled on Hartshorne's theological writings when I was trying to understand my old psychedelic trip. He envisioned a god who, far from being omniscient and omnipotent, is incomplete and ever-evolving. Thinking that Hartshorne might respond to my neurotic-god idea, I called him at his home in Texas. The conversation didn't go well. Hartshorne treated me like a crank. I wanted to say, Hey man, if I'm a crank, you are too.

Morch was done, my turn to talk. I plugged in my laptop, got my presentation displayed and started babbling. My talk was titled "The Quest for Consciousness: A Skeptic's View." I said there had been little or no progress in understanding consciousness since the first meeting in Tucson in

1994. If anything, things had regressed. There were more theories of consciousness than ever. Abundance of theories, like abundance of treatments for a disease, means nothing really works.

As usual when I give a talk, I was in an altered state. The audience's attention seemed to compress and heat my brain. A quantum telekinetic effect, perhaps? I heard chants or yelps from an adjacent session. Or were these hallucinations secreted by my pressurized brain? The session chair raised his hand, his fingers splayed. Only five minutes left??!!

I took my shot at quantum consciousness. I had just emailed Christof Koch to ask if quantum-consciousness theories should be taken seriously. I flashed a slide with Koch's response: "No empirical data on large-scale quantum effects (e.g., coherence) in central structures in the brain (only for photosynthesis in algae). So very unlikely that such effects play a major role in cognition, including consciousness." Someone grumbled, probably the quantum-consciousness fanatic Hameroff. Hoping to mollify him, I made a few derogatory remarks about Koch's pet idea, integrated information theory.

After my talk ended, relief flooded me, and my derealization ebbed. Good talk, John, Kauffman said with a little smile. I suspected irony, but I felt too good to care. He asked if I wanted to join him and a friend for dinner. I said sure. Kauffman's friend turned out to be a prominent American roshi, or Buddhist teacher. The topic of psychedelics arose, and Kauffman and the roshi confessed, to my surprise, that they were psychedelic virgins. I bragged about slurping ayahuasca on a cliff overlooking the Pacific, and chewing peyote in a teepee in Arizona.

The conversation veered to telekinesis, and now I was the virgin. Kauffman and the roshi claimed they had bent spoons telekinetically, with the help of some tactile pressure. You rub the shaft of the spoon until it goes limp, like a reverse erection. Kauffman had bent a spoon once, in a workshop at Esalen, and he had tried and failed to do it subsequently. He promised to send me a photo of the bent spoon (and he did).

My heart sank. I associate spoon-bending with tacky celebrities like Uri Geller. Kauffman was really testing my tolerance. But he was so excited, even child-like, as he recalled the time he bent a spoon that I ended up finding his revelation endearing. He had more to lose than to gain by telling me this. His honesty was admirable, I decided.

The roshi was a different story. I didn't like him. He said he had bent

spoons many times and could do it whenever he chose. I asked him to bend a spoon at our table. He wasn't in the mood, he said. I smirked. You don't believe me? the roshi asked. You think I'm a liar? He was a large man with a shaved skull. I replied, I can't throw out my entire skeptical, materialistic worldview because someone I barely know tells me he can bend spoons. He glared at me, then abruptly bared his teeth in a feral grin. Derealization flooded me. I thought, Is this a dream?

If you asked me at that moment if I believed in telepathy and telekinesis, I don't know how I would have answered. One part of me might have said yes, another no, another maybe. Another part would have been so absorbed in the weirdness of the moment that the question would have seemed silly and irrelevant.

I'm not sure if Stuart Kauffman has shifted my mind-body beliefs, but he has definitely shifted how I judge the beliefs of others. His story about the death of his daughter nudged me away from skepticism and toward compassion. Life can be brutal. As long as your mind-body story isn't harmful to yourself or others, believe whatever gets through the night. Believe that this universe is our home, we were meant to be here, everything is going to be all right. For many people, for me on bad days, that is harder to believe than spoon-bending.

Chapter Five

# The Freudian Lawyer: The Meaning of Madness

The easiest way to get students to think about the mind-body problem is to bring up mental illness. Many find debates over consciousness, free will and the self too abstract, but they all care about depression, anxiety and substance abuse. These disorders force us to ask, in an especially urgent way, who we really are.

Modern psychiatry, I inform my classes, has embraced the physiological paradigm of mental illness. It stems from flawed genes or neurochemistry and is best treated with physiological remedies, such as antidepressants. This emphasis is good in some ways, because it reduces the stigma of insanity. It's not demonic possession, or your parents' fault, or a failure of character or willpower. It's a disease, like diabetes. But this view can lead to despair if you think that biology is destiny. Also, medications are far from a panacea. That's why psychological therapies persist, from cognitive-behavioral therapy to mindfulness meditation. So what is the evidence for various theories and therapies? And why do attitudes toward mental illness vary so widely across eras and cultures?

I encourage students to write about these questions—and, if they choose, to describe how mental illness has affected them or people they know. This personal approach, I say, can be a good way to hook readers emotionally and pull them into your story. When my students take advantage of this first-person option, their papers often surprise and dismay me. Here is a sampling from a recent class, with names changed. Tyler wrote about his brother's depression, Karen about the suicide of a teenage friend, Trevor the heroin addiction of his girlfriend's mother. Melanie admitted that she never felt much sympathy for people who were depressed until, out of the blue, "IT" struck her:

"One minute I am a happy girl, I have had a perfectly good life so far, and I have never really pondered anything upsetting or had any major setbacks. The next minute IT happens… stress, anxiety, dietary changes, sleeping changes, moodiness, risky behavior, apathy, hopelessness. IT hit me

like a bulldozer out of left field."

One drawback of this assignment is that papers are impossible to grade. If Jennifer reveals her fear that she has inherited her mother's crippling depression, I'm not going to complain that her kicker lacks oomph. I usually give everyone an A. Students seem to find disclosing personal struggles cathartic. As Melanie wrote:

"When I finally started talking about the problems I was having, it turned out that so many people around me were having or had had similar issues. Several of my close friends came out to me about their struggles with depression, and many of them are currently on treatment for depression."

Mental illness exacerbates the solipsism problem, our inability to know each other. We feel weird and ashamed, so we keep our illness secret, which can make it worse. But sharing our suffering can relieve our pain and help others, too. To dramatize this point, I tell my students the story of Elyn Saks.

Saks has impressive scholarly credentials. After graduating from Vanderbilt at the top of her class, she earned a master's in philosophy from Oxford. At Yale Law School, from which she graduated in 1986, she edited the law journal. The University of Southern California Law School hired her in 1989, and she became Orrin B. Evans Distinguished Professor of Law, Psychology, and Psychiatry and Behavioral Sciences. In 2010 she got a doctorate in psychoanalysis, the theory/therapy invented by Freud.

Saks has written books on psychoanalysis, multiple-personality disorder and the rights of mentally impaired patients. Not until The Center Cannot Hold: My Journey Through Madness was published in 2007 did Saks reveal why she has so much expertise and interest in insanity. She is a schizophrenic. Let me restate that, and this is an important distinction. She is a person who has struggled with schizophrenia. Only a few family members, friends, colleagues and therapists knew about her illness before the release of her memoir.

Center is packed with objective information. Saks notes that the Diagnostic and Statistical Manual of Mental Disorders, or DSM, which represents the consensus of the American Psychiatric Association, distinguishes between disorders of thought and disorders of mood. She writes:

"Schizophrenia is an example of a disorder that affects thinking, and

so it is referred to as a thought disorder. Bipolar disorder (what used to be called manic depression) is an example of a mood or "affective" disorder—a disorder that rests primarily in how one feels. The DSM places schizophrenia among the thought disorders characterized by psychosis. Psychosis is broadly defined as being out of touch with reality—what one of my Yale professors once referred to as 'nuts.'"

What makes Saks's memoir extraordinary are her subjective descriptions. Take her recollection of a breakdown at Yale Law School. It began with her babbling incoherently to classmates in the library and twirling around in a professor's office, arms "thrust out like bird wings." She spewed out "word salad," streams of words loosely associated with each other, as though an internal punning function had gone haywire. "My name is Elyn. They used to call me 'Elyn, Elyn, watermelon.' At school, where I used to go. Where I am now and having trouble… There's trouble. Right here in River City. Home of the New Haveners. Where there is no haven, new or old. I'm just looking for a haven."

She ended up in an emergency ward of Yale-New Haven Hospital, where attendants forcibly sedated her. Here is what that felt like:

"Strapped down, unable to move, and doped up, I can feel myself slipping away…. On the other side of the door, looking at me through the window—who is that? Is that person real? I am like a bug, impaled on a pin, wriggling helplessly while someone contemplates tearing my head off. Someone watching me. Something watching me. It's been waiting for this moment for so many years, taunting me, sending me previews of what will happen. Always before I've been able to fight back, to push until it recedes—not totally, but mostly, until it resembles nothing more than a malicious little speck off to the corner of my eye, camped near the edge of my peripheral vision… Nothing I can do. There will be raging fires, and hundreds, maybe thousands of people lying dead in the streets. And it will all—all of it—be my fault."

Before the ascendance of the biological paradigm of mental illness, many psychiatrists assumed that schizophrenia resulted from childhood trauma, usually inflicted by parents. But Saks, who grew up in Miami, had an idyllic childhood. "I woke up almost every morning," she recalls in her memoir, "to a sunny day, a wide clear sky, and the blue green waves of the Atlantic Ocean nearby." Her parents weren't perfect, no parents are, but they

doted on Saks and her two brothers.

Schizophrenia "rolls in like a slow fog," Saks writes, "becoming imperceptibly thicker as time goes on." At seven or eight, she displayed "little quirks," like repeatedly washing her hands, or imagining a bad person lurking outside her bedroom window. She had bouts of what she calls "disorganization," in which "consciousness gradually loses its coherence," and her self dissolves into a jumble. In college she had friends and a boyfriend, but sometimes she forgot to bathe, and she once compulsively swallowed a bottle of aspirin. When she and her boyfriend made love, the loss of self-control alarmed her. It felt like "disorganization."

She had her first full-blown psychotic break in the late 1970s at Oxford, where she was pursuing a master's in philosophy. Beings within her insisted she was evil and deserved to die. She burned herself with cigarettes and fantasized about dousing herself with gasoline and setting herself on fire. One day, she looked at herself in a mirror. "Holy shit… Who is that?" she recalls thinking in her memoir. "I was emaciated, and hunched over like someone three or four times my age. My face was gaunt. My eyes were vacant and full of terror. My hair was wild and filthy, my clothes wrinkled and stained. It was the visage of a crazy person." She committed herself to a hospital and reluctantly took medications.

Saks has been hospitalized three times for periods totaling hundreds of days. Doctors called her prognosis "grave," which meant that she would probably never be fully autonomous or have a sustained romantic relationship, and she would hold, at best, menial jobs. But she refused to succumb to her illness. Although she feared speaking in class and writing papers, professors kept giving her good grades. At Yale a professor called to tell her she'd written the best exam in the class. "Each time it happened," Saks recalls, "in spite of the grades I'd earned in the past, this kind of comment came as a surprise."

In 1998 Michael Lauder, celebrated for graduating from Yale Law School in spite of his schizophrenia, stabbed his fiancée to death. This incident prodded Saks into writing her memoir. She wanted to counteract the stigma surrounding schizophrenia, to assure people that "the large majority of schizophrenics never harm anyone." She also wanted to give hope to others with mental illness, to let them know that a diagnosis "does not automatically sentence you to a bleak, painful life." In an especially poignant passage of her

memoir, Saks dwells on how schizophrenia differs from illnesses like cancer and heart disease.

"Who was I, at my core? Was I primarily a schizophrenic? Did that illness define me? It's been my observation that mentally ill people struggle with these questions even more than those with serious physical illnesses, because mental illness involves your mind and your core self… If, as our society seems to suggest, good health was partly mind over matter, what hope did someone with a broken mind have?"

Good question. I wanted to ask Saks about her success, and whether it had anything to do with how she viewed her illness. Did she see schizophrenia as strictly physiological? Was it in any way a gift as well as a curse? Had her psychoses given her any insights into mind-body puzzles like free will and the nature of the self? What did her madness mean to her?

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When I called Saks to ask for an interview, she responded with what I would learn was characteristic modesty. "I don't know that I know much about the mind-body problem," she said. She agreed to meet me after I assured her that she had just the kind of personal and professional expertise I was seeking.

As I walked, on a blindingly sunny summer day, onto the University of Southern California Campus, I wondered what Saks would be like in person. As the narrator of her memoir, she seemed warm and witty, but I was prepared for sharp edges, prickliness, guardedness. Saks's psychoses seethed with violent imagery. In her memoir, she describes how thoughts "crashed into my mind like a fusillade of rocks someone (or something) was hurling at me—fierce, angry, jagged around the edges, and uncontrollable."

My assumption was that mental illness makes you too self-absorbed, preoccupied with your distress, to be considerate of others. That's how I was when I got depressed in the early 1980s. In Sylvia Plath's quasi-fictional memoir The Bell Jar, she was cold, even cruel, to some of her desperately unhappy friends.

I knew I had found Saks's office in the Gould School of Law when I

came across a door covered with cartoons:

A shrink says to Humpty Dumpty, who lies on a couch, “Eventually I’d like to see you put yourself back together.”

A drowning man says to a dog, “Lassie, get help!” In the next panel, Lassie is lying on a couch talking to a therapist.

A caller to the “Psychiatric Hotline” listens to the options: “If you are OCD, please press 1 repeatedly. If you are co-dependent, please ask someone to press 2 for you. If you have multiple-personality disorder, please dial 3, 4, 5 or 6.”

I was jotting down the jokes when the door opened and a woman stood before me. She was tall, with noble facial features, high forehead, long, straight nose, firm, full-lipped mouth. She looked like Athena, except less prideful, and she wore not a toga but black pants and a black-and-white striped turtleneck. Her hair was thick, gray, untamed.

“Are you John?” She met my eyes with a level gaze. I apologized for being early. No problem, we could talk after she went to “the loo” (an aftereffect of her Oxford days). We spent an hour in the faculty lounge, down the hall from her office, and then walked to a nearby campus restaurant, where we sat outside.

I couldn’t help scrutinizing Saks for symptoms. She walked stiffly, arms at her sides. Her hand trembled slightly as she raised a cup of tea to her lips. Side effects of medication? As we talked in the faculty lounge, several colleagues got drinks or snacks from a counter. Each time Saks swiveled to see who it was and say Hi. Is that odd? I wondered. At the restaurant, she went to the “loo” again and took a while to return. She confessed that she had momentarily forgotten we were sitting outside. Tests showed that she had a “moderately bad memory.” She wasn’t sure if the cause was her illness, her medications, age or something else.

How oppressive to know that people are always watching you, interpreting you, judging you in the light of your illness. We all have quirks, but most are dismissed as amusing or annoying. Not so the peculiarities of someone diagnosed with schizophrenia, which psychiatrists describe as causing “bizarre” thoughts and behavior. Does any other medical diagnosis include such a judgmental criterion?

Saks was, for the most part, remarkably unremarkable. Her face and words were expressive, and she laughed easily and often. The biggest

surprise was how humble and considerate she was, even sweet. “I feel bad that you would come all this way just to see me,” she said. She was glad when I said I had visited old friends in Los Angeles, abashed when I said I contacted them only after arranging to meet her. She pressed me for details on my book project and responded with utterances of encouragement, like “Wow” and “Amazing.”

At one point I recalled a line in her memoir, “I used to be God, but I got demoted.” Her quip, I said, reminded me of a psychedelic trip during which I became God and freaked out. Long after the trip, I said, I had scary flashbacks. As the words left my mouth, I felt mortified. I was a paintball player bragging to a veteran of the Battle of the Bulge. But Saks nodded sympathetically. She took mescaline in high school, she said, at a drive-in movie with friends. She remembers seeing a lot of colors. The experience didn’t really resemble her psychotic states, she said, but it “scared the shit” out of her. She was so upset that she told her parents about her trip, “which any reputable teenager would never do.” She laughed.

The intensity of her illness has declined, as it does for many people with schizophrenia. “It’s sort of silly to quantify it in this way,” she said, but when she was at Oxford, up to 80 percent of her thoughts were psychotic. That figure has declined to under five percent today. She hasn’t had the kind of breakdown that leaves her “crouched in the corner shaking” for more than a decade. She still has to manage her illness. “I don't have the flexibility that other people have,” she said. She tries to minimize travel and public speaking, which make her anxious. She reads student papers but no longer teaches in a classroom.

I confessed I had been nervous about meeting her, because I hadn’t known what to expect, but she was… I stopped before I said “normal,” but the unsaid word hovered between us. She smiled. If she was offended, she didn’t show it. When I asked if she had always been so “nice,” she laughed. She recalled a student evaluation that said, Professor Saks is a very nice person but a very mediocre teacher. She thought she had always been pretty nice, which explained why, even at her sickest, she had friends who could help her. Her illness has also made her more considerate. “Going through what I went through can make you more empathetic.”

She is acutely aware of how much her success has depended on luck. In her memoir she writes, “I’d feel terrible to learn that anyone had read this

book and said to a family member or friend, ‘She did it, so can you.’” She had many advantages, including supportive friends, excellent medical care, meaningful employment and loving, affluent parents, who could afford to send her to college and graduate school. “Treatment, people and work are the three things that helped me,” she said.

Saks has dedicated herself to helping others less fortunate than she, of whom there are far too many. Decades ago, many state mental hospitals closed as a result of supposed improvements in anti-psychotic medications, and legal reforms made it harder to hospitalize patients against their will. This trend “could have been a good thing if it put other services in place,” Saks said. But many mentally ill people end up on the streets, homeless, or in prison because they lack adequate care.

Mental illness poses agonizing legal and ethical dilemmas, Saks said, for which there are no easy solutions. Take the case of “Billy Boggs,” a woman who lived on the streets of New York City in the late 1980s. New York City officials, responding to complaints that Boggs was harassing passers-by, hospitalized her against her will. The American Civil Liberties Union helped Boggs win her release, expanding the rights of the mentally ill to reject treatment.

When Saks asked law students how Billy Boggs should have been treated, they had “conflicted feelings.” Most said that, if they were judges, they would not commit Billy Boggs. “When I say, ‘What if Billy Boggs were your sister?’ many will say, ‘Well in that case I would take her to a hospital.’” When they imagined being Billy Boggs, many students replied, “I wouldn’t want to be forced.”

Saks leaned toward giving people as much autonomy as possible. In her 2002 book Refusing Care, she argues that people should be forcibly restrained and medicated only if they are endangering themselves or others.

Saks has also challenged the “myth” that people with the illness are prone to violence. “The reality is we account for 2 or 3 percent of violent crime,” she said. People with schizophrenia “are much more likely to be the victimized than victimizers.”

Reason can persist even in the floridly psychotic. As an example, Saks cites the case of Daniel Schreber, a German judge who became psychotic in 1884, when he was in his early 40s. In a 200-page tract published in 1903, when he was locked up in an asylum, Schreber explained

that had become a woman to seduce God, who had been threatening him. He and God were getting along fine now, which was a “glorious triumph for the Order of the World.” Schreber concluded his mad memoir with what Saks called a “totally lucid” legal argument against the involuntary commitment of the insane. Schreber won a few years of freedom, but he died in an asylum in 1911.

To counteract the stigma of mental illness, Saks and several colleagues are carrying out a study of “high-functioning” people with schizophrenia. They include physicians, lawyers, a teacher and the CEO of a nonprofit. Most have not publicly disclosed their illness, and “they tend to make less money than someone with a similar position.” But these cases show that people with the illness can live independently, hold good jobs and enjoy friendships and romantic relationships.

In a 2013 New York Times essay, “Successful and Schizophrenic,” Saks notes that the subjects of her study cope with their illness in diverse ways. They pray to God, challenge their delusions, drown out their inner voices with music, immerse themselves in work. When she feels herself “slipping,” Saks writes, she reaches out to doctors, friends and family, eats “comfort food,” like cereal, and cuts back on stimulation. Work is her “best defense,” because it “keeps me focused, it keeps the demons at bay. My mind, I have come to say, is both my worst enemy and my best friend.”

Saks never regretted going public about her illness. Yes, an administrative colleague at the law school pulled away from her after her memoir was published, and an alumnus of USC law school complained that it should not have hired her. But she has received “an outpouring of kindness and affection and gratitude.” No longer having to keep her illness secret has been an enormous relief.

And yet she still hesitates to disclose her disease to strangers. If someone sitting beside her on a plane asks about her life, she usually doesn’t mention her illness. When a patient-advocacy group asked her to wear a t-shirt that read, “Schizophrenia,” she declined. People with cancer “wear armbands and pins and t-shirts with pride and in solidarity and without shame,” she said. “That’s the way it should be with schizophrenia, but we’re not there yet. We’re just not there.”

We fear what we don’t understand, and schizophrenia remains profoundly mysterious. The consistent epidemiology of schizophrenia

suggests that it is at least partially genetic. It afflicts roughly one percent of the global adult population, and onset usually occurs in the late teens and early twenties. If your parent or sibling has schizophrenia, your risk of getting the disease rises as high as 10 percent. If your identical twin is schizophrenic, the risk is almost 50 percent.

On the other hand, a majority of people with schizophrenia have no first-order relatives with the disease. Researchers have linked schizophrenia to many non-genetic factors, including viruses, the self-replicating proteins called prions, emotionally cold “refrigerator mothers,” poor maternal nutrition, maternal smoking, birth complications and an assortment of childhood traumas. No one really knows, in other words, what causes schizophrenia.

When I first reported on schizophrenia in the late 1980s, scientists were confident that they would soon link it to genetic mutations and brain abnormalities, and that these findings would lead to improved treatments, even cures. These hopes were never fulfilled. Researchers disagree over whether schizophrenia is a disorder of the brain or the mind, a product of nature or nurture. Symptoms are often confused with those of bipolar disorder, severe depression and multiple-personality disorder. Saks wasn’t given a definitive diagnosis of schizophrenia until she had been ill for years.

Some experts, including Saks, question whether schizophrenia is a single disease. Symptoms fall into two categories, positive and negative. The former include auditory hallucinations, jumbled thoughts and speech, bizarre delusions and behavior. The latter range from apathy to complete non-responsiveness, or catatonia. Saks lacks negative symptoms. “I am very different from someone who sits in front of a TV in a dayroom all day,” she said. Medications have helped her, but they are often ineffective at treating negative symptoms.

Saks suspects that schizophrenia is at least partially genetic. One other person in her extended family has been diagnosed. But she emphasized that she views schizophrenia as a biological disorder for a pragmatic reason, because it makes accepting pharmacological treatment easier. Early in her illness, she resisted medications. If she could get better without them, she reasoned, that would prove her diagnosis was “a terrible mistake.” Only after she suffered a breakdown in the mid-1990s did she stay on meds once and for all.

She is well aware of concerns that antipsychotic medications have debilitating side effects. Saks showed signs of the movement disorder called tardive dyskinesia on the anti-psychotic Navane, but the syndrome faded when she switched to newer drugs, Zyprexa and clozapine. “I would not even think about getting off meds at this point,” she said. “They really help me.” If she had to choose between gaining 10 or 20 pounds and being psychotic, she’d accept the weight gain. “A hundred pounds, and I might feel differently.”

We fear mental illness, but we fetishize it, too. Madness “is the channel by which we receive the greatest blessings,” Socrates says in Phaedrus. “Madness comes from God, whereas sober sense is merely human.” This view has persisted. The book and film A Beautiful Mind, about mathematician John Nash, who won a Nobel Prize in economics in 1994, suggest that Nash’s schizophrenia and genius were intertwined. Nash discerned patterns no one else could see. Although some of his perceptions were delusional, others led to major advances in game theory.

During her psychoses, Saks often felt buffeted by divine or demonic forces. Some visions resembled the counter-factual thought experiments she encountered while pursuing a master’s in philosophy. Philosophy and psychosis “have a lot in common, more than philosophers would care to admit,” she said.

Philosophers “play with things that psychotic people live.” Descartes and others toyed with solipsism, the idea that nothing exists beyond your self. “No philosopher walks around thinking there is no external world,” Saks said, “but some psychotic people do.”

Saks has always resisted seeing her psychotic thoughts as revelations. Far from giving her deep insights into reality or the mind-body problem, they tend to be “sub-standard,” “troubled,” “confused.” She was once struck by Capgras syndrome, which convinces you that friends and loved ones have been replaced by identical imposters. Saks didn’t think she was glimpsing a deep truth about the illusory nature of the self. The syndrome terrified her and convinced her to stay on meds.

Nor does Saks see insanity as a kind of non-conformity, an appropriate response to an insane world. This view was popularized by counter-culture psychiatrists like R.D. Laing and Thomas Szasz and films like King of Hearts and One Flew Over the Cuckoo’s Nest. Szasz and Laing

raised “interesting and difficult philosophical questions about mental illness,” Saks said. But she believed that “people who adapt to the crazy world are a lot happier and more successful.”

Saks has no affection for her illness. “I don’t really romanticize being psychotic,” she said. At the end of her memoir, she quotes Rilke explaining why he shunned psychoanalysis. “Don’t take my devils away,” he wrote, “because my angels might flee too.” Saks rejects that stance. If she could take a pill that cures her, banishing her devils, she would do so “in a heartbeat.” Most of the people she knows with schizophrenia feel the same way.

But Saks, again, does not insist that others share her perspective. “I take the view that it’s biochemical and responds to medication and therapy not because I have done the heavy philosophical lifting but for the pragmatic reason that it makes my life better. If it makes your life better to think it’s an alternative way of being, and a window into the mind of the cosmos, or whatever it is, good for you! Whatever works for you.”

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Saks does not view schizophrenia as merely a biological disorder, treatable only with medications. Although she dismisses the cosmic, metaphysical import of her psychotic thoughts, she thinks they have personal psychological significance, which she has explored through psychoanalysis.

Saks’s affinity for the theory/therapy invented by Freud is a remarkable subplot of her remarkable story. She has tried other therapies, such as cognitive-behavioral therapy, which focuses less on excavating the past than on changing negative thought patterns. “I know it has got a strong research base, but for me it was kind of silly and infantilizing.” She finds psychoanalysis “richer and deeper” than rival approaches.

Saks first underwent psychoanalysis after her breakdown in Oxford, where physicians recommended that she see an analyst four or five times a week. Freud, ironically, thought psychotic patients could not form the bond with the analyst needed for successful treatment. But Saks’s analyst, whom she calls “Mrs. Jones” in her memoir, practiced a type of psychoanalysis developed in the 1930s by Melanie Klein, who believed psychosis is

treatable.

Klein, who thought Freud exaggerated children's sexuality, focused on love rather than sex, but her view of childhood was hardly sentimental (especially when compared to Alison Gopnik's). According to Klein, love, because it makes us dependent on someone else, inevitably leads to fear, anger and other negative emotions. Even as babies, we seethe with desire and rage. In our first six months, we go through a "paranoid-schizoid" period, during which our emotions have no clear object, because we cannot distinguish between ourselves and others.

Later we pass through a "depressive" stage, in which the objects of our love, especially our mothers, also evoke fear, hate and envy. These feelings trigger guilt and self-loathing. We feel mixed emotions toward loved ones throughout our lives. Psychoanalysis, ideally, helps us overcome negative emotions by recognizing their causes.

The Kleinian analyst tries to remain "anonymous," Saks explained, becoming a blank slate on which the patient projects her emotions. In her case, the technique worked almost too well. Saks loved and loathed Mrs. Jones, whom she called "an evil monster," "the devil," "a witch." She once threatened to kidnap Jones and imprison her in her apartment. Nothing rattled the analyst. She treated her patient's outbursts as opportunities for insight. Saks, in her memoir, calls Jones "the glue that held me together" at Oxford.

Saks grew up in a family in which expressing negative emotions was discouraged. "You were supposed to feel respect for your parents and never get angry." As a result, she was "illiterate psychologically." But Mrs. Jones encouraged her to express her strangest, darkest emotions. In her memoir, Saks recounts this exchange:

Me: I had a dream. I was making golf balls out of fetuses.

Mrs. Jones: You want to kill babies, you see, and then make a game out of it. You are jealous of the other babies. Jealous of the your brothers, jealous of my other patients. You want to kill them. And then you want to turn them into a little ball so you can smack them again. You want your mother and me to love only you.

Saks saw other analysts after leaving England. "I know that termination is part of the process," she told me, but she is "a lifer." She is also a trained analyst herself. In the mid-1990s she enrolled in a doctoral program run by a psychoanalytic institute in Los Angeles. As part of her

training she treated patients under the supervision of another analyst. She stopped only after her memoir was published, because she had lost her anonymity.

Psychoanalysis works in several ways, Saks said. It “creates a safe place” where you can express your “dangerous and chaotic and scary thoughts” to a caring person, and it helps you cultivate an “observing ego.” Mrs. Jones got Saks to see her violent thoughts as a “defense against fear. And that made me understand, and made the fear go away.” Self-knowledge can be painful. “You learn some bad things about yourself, some unpleasant things, guilt-producing things,” Saks said. Psychoanalysis helped her understand that along with “the good, Pollyanna Elyn,” there is also “the Elyn who is envious and jealous.” But knowledge of yourself in “all your complexity” is ultimately empowering.

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Saks calls psychoanalysis “the best window into the mind” and the “most interesting account of what it is to be human.” Jung and others produced interesting variants, but Freud is “the granddaddy” of psychoanalysis, Saks said. He was “an amazing writer” whose case studies “read like novels.”

And yet Freud may be the most maligned figure in the history of science. As soon as he started proposing his ideas in the late 19th century, critics pounced on him, with good reason. Freud never provided solid empirical evidence for the superego/ego/id triad, infantile sexuality, the Oedipal complex, penis envy, death instinct, transference, the repression theory of dreams and all the other conjectures that comprise the sprawling corpus of psychoanalysis.

Freud’s most adamant modern critic is Frederick Crews. Crews was a prominent practitioner of Freudian literary criticism before rebelling against his former idol. With the zeal of an apostate, Crews accused Freud of lies, greed, megalomania and cocaine-abuse in a series of sensational articles in The New York Review of Books in the 1990s. In 2017 Crews renewed his assault in Freud: The Making of an Illusion. The New York Times described

it as “700-plus pages of Freud mangling experiments, shafting loved ones, friends, teachers, colleagues, patients and ultimately, God help us, swindling humanity at large.”

Here’s the question. If Freud was really such a fraud, why do many modern mind-scientists, like Christof Koch and Alison Gopnik, still cite him approvingly (albeit with qualifications)? Why do Elyn Saks and many other people still undergo psychoanalytic treatment? Why does Freud remain so influential that Frederick Crews must keep returning to “stab the corpse again,” as a reviewer put it?

The answer is that old theories die when better ones replace them, and science still hasn’t produced a theory/therapy potent enough to render psychoanalysis obsolete.

Comparisons of the many variants of psychoanalysis to cognitive-behavioral therapy and other psychotherapies show that all have roughly the same outcomes.

Over the past half century, medications have become the dominant treatments for mental disorders, but they are much less effective than proponents claim. Medications help some people, especially in the short term, but over the long run, for large populations, they may do more harm than good. As prescriptions for psychiatric drugs have surged in the U.S., so have disability payments for severe mental illness.

Just as the biological paradigm for understanding consciousness has collapsed over the past two decades, so has the biological paradigm of psychiatry, which emphasizes physiological rather than psychological causes and cures. Schizophrenia demonstrates this point. In the 2016 book Schizophrenia and Its Treatment: Where Is the Progress?, psychologist Matthew Kurtz notes that “outcomes for people with the disorder have remained highly recalcitrant to change over the past 100 years.”

These are negative reasons for Freud’s persistence. The positive reason is that Freud was an intrepid, imaginative, eloquent explorer of the mind-body problem. Unlike, say, most treatises on the physiological basis of mental illness, Freud’s work is dense with meaning. Literary theorist Harold Bloom has ranked Freud alongside such great modern writers as Proust, Joyce and Kafka and extols “his vision of civil war within the psyche.”

When critics harp on Freud’s failures as a scientist, they are committing a category error. Would we care if we learned that Shakespeare

was a misogynistic bully and boozer who mangled history in his plays and stole ideas from other writers? Maybe we'd care a little, but we would probably keep reading Shakespeare, because he helps us make sense of the tragicomedy of our lives. So does Freud. Trying to make sense of the mind-body problem, he concocted stories with the depth and subtlety of great literature. And when it comes to understanding the mind and its disorders, at this point all we have are stories.

That is not to say that anything goes. In her 1991 book Interpreting Interpretation Saks examines different philosophical takes on psychoanalysis. One holds that interpretations of a patient's symptoms are simply "stories," and if a story makes a patient feel better, that is all that matters. Facts are irrelevant. Saks rejects this attitude, pointing out that false stories can have devastating consequences.

When she was writing Interpreting Interpretation, many therapists were encouraging patients to "recover" memories of sexual abuse by parents or other adults. Therapists said they didn't care if the memories were false, as long as they made patients feel better. Saks calls this view irresponsible and potentially destructive. Truth matters, too. Her pragmatic philosophy could be summarized as follows: If you are ill, believe whatever works for you—whatever helps you overcome your illness and live a good, meaningful life—but try to avoid beliefs that are demonstrably false and harmful to you and others.

When I asked Saks if she believed in free will she responded, "Oh God, that's a really tough one." She leaned toward "soft determinism," which says that all our acts are caused, but we nonetheless have free will as long as our acts are not compelled. She wasn't comfortable with this stance, because she didn't see that much distinction between causation and compulsion.

I pitched my idea that free will must exist if we have more of it at some times than others. She has more free will now, for example, more capacity for self-control, for discerning and acting on choices, then when she was psychotic. She certainly has more than when she was medicated and locked up against her will. "That's an interesting idea," she said, nodding. "I think you should spin it out."

I found Saks's modest response ironic, because I see free will, or freedom, as her polestar, the central theme of her life and work. More than the rest of us, the mentally ill are constrained, not just by their biology but

also by cultural and medical prejudices, by legal and economic conditions, by the whims of insurance companies and politicians. Saks wants to ease these constraints. She wants others afflicted with mental illness to be as free as possible to choose their own mind-body theories and therapies, their own stories. She wants to empower them to figure out who they really are and find happiness on their own terms, as she has.

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In 2014, singers performed an opera based on The Center Cannot Hold in Los Angeles. The opera, which a composer created with Saks's collaboration, ends with Saks and her Yale classmates, in caps and gowns, celebrating graduation. Elyn exults that she has gotten a mentally ill client released from a hospital. Meanwhile her classmate Dan is in despair. His client, after Dan got him freed, burned down his home, killing his father, mother and brother. This is a real incident, which Saks describes in her memoir. "I've won my case, spit in my face," Dan sings bitterly.

"That's awful Dan," Elyn sings to him. She agonizes over whether her fight for patient rights, inspired by her own forced treatment, is misguided. "How can I know?" she wails. She adds defiantly, "No! I won't be tied down to a bed ever again!"

Another classmate, Steve, tells her he has fallen in love and is moving away. Elyn begs him not to leave her, and he assures her she will do fine without him. He urges her to keep fighting for patients' rights. "I am so proud of you, Elyn," he sings. "Your life has been the story of fighting for what you need and winning…. You have therapists, friends, professors, clients who believe in you. You will survive, and you can thrive."

In addition to schizophrenia, Saks has survived three bouts of cancer and a stroke, and she has indeed thrived. In 2009, she won a MacArthur "Genius" Award, and she used the money to found the Saks Institute for Mental Health Law, Policy, and Ethics. Every year, the institute hosts a conference on a different mental-health issue, including mechanical restraints, medications, criminalization of mental illness and cinematic portrayals of madness.

In 2001 Saks married Will, a librarian at the USC law school. He accommodates her needs. He doesn't mind that she works seven days a week, because he knows she finds the routine comforting. "We both love being together, but we love being apart as well," Saks told me. "So I'll come home, and we'll sit in front of the TV and eat dinner together. And then I'll go to my room and listen to music, and he'll go to his room and work on the computer. It suits us well."

Saks somehow combines fortitude—a ferocious determination to overcome obstacles—with intellectual humility. My friend Jim McClellan, the postmodern historian who insists that even our best scientific theories are "stories," would appreciate her view of mental illness: Don't ask whether psychopharmacology, behavioral genetics, Buddhism, Jungian dream analysis or other approaches to mental illness are true. Ask whether they work.

Some of us struggle more than others to find something that works, that gives us meaning and happiness, but we all struggle. My students remind me of that when they write about how mental illness has touched them. After we go over their papers, which can be harrowing, I show them a 2012 TED talk by Saks that has been viewed millions of times. Since meeting Saks, I find the video even more moving, because I know how much she hates public speaking. "The humanity we all share," she concludes, "is more important than the mental illness we may not. What those of us who suffer with mental illness want is what everybody wants: in the words of Sigmund Freud, 'to work and to love.'"

Freud, our gloomiest self-help guru, offered what was in some respects a dark vision of the human condition, in which forces beyond our comprehension and control torment and even destroy us. Psychoanalysis nonetheless rests on two upbeat assumptions: We can understand ourselves better if we work hard at it, and self-knowledge can ease our distress.

Freud once said the goal of psychoanalysis should be turning "neurotic misery into common unhappiness," but Saks has done better than that. When I asked if she was happy, her face lit up. "Yeah! Yeah!" she replied, as if surprised at her own answer. Her current psychoanalyst "thinks of me as someone who's unhappy, I guess because I bring my unhappiness there." She laughed. "I think I'm happy and my analyst thinks I'm not." Even when her illness was acute, she had "moments" of happiness, and now she

has many more. “I think I have a really good life,” she said.

Someday science might produce gene therapies or brain implants that eradicate schizophrenia and other mental illnesses. We will then face a momentous choice, because such technologies could also conceivably cure us of common unhappiness and angst. We might become so content, even blissful, that we cease agonizing over who we are. The mind-body problem will no longer be a problem, because we will no longer be human. In that world, perhaps, Freud will finally be dead.

Chapter Six

# The Philosopher: Bullet Proof

In 2016 I joined a philosophy salon in New York City. All the participants except me have academic training in philosophy, and some are actual, full-time, professional philosophers. Roughly once a month, seven or eight of us meet in the salon-runner's apartment to munch chocolate biscuits, sip wine and argue about a paper. Whatever the topic—the vagueness of knowledge, Wittgenstein's mysticism, the dubiousness of moral rules—we often end up bickering about what philosophy is, or should be. What is its purpose? Its point?

In one session we considered "Why Isn't There More Progress in Philosophy?" by David Chalmers. Chalmers is almost comically passive-aggressive in the paper, veering between defiance and doubt. He opens by declaring that "obviously" philosophy achieves some progress, but the rest of his paper undercuts that modest assertion. Science and philosophy have different methods and results, Chalmers notes. The former consists primarily of empirical investigations, the latter of argumentation. Science has turned out to be a much more potent method of generating truth. Whereas scientists converge on answers to questions, "there has not been large collective convergence to the truth on the big questions of philosophy."

A survey of philosophers carried out by Chalmers and a colleague revealed deep divisions on big questions: What is the relationship between mind and body? How do we know about the external world? Does God exist? Do we have free will? Where does morality come from? Philosophers' attempts to answer such questions, Chalmers remarks, "typically lead not to agreement but to sophisticated disagreement." That is, progress consists less in defending truth claims than in casting doubt on them. Chalmers calls this "negative progress."

Chalmers tries to stay upbeat. He insists that just because philosophers haven't solved any major problems yet doesn't mean they should stop trying. They should keep doing their best "to come up with those new insights, methods and concepts that might finally lead us to answering

the questions." This is an expression of faith. Like a valiant officer, Chalmers is exhorting his troops to keep charging forward when even he suspects the battle is unwinnable.

As if to prove Chalmers's point about philosophy's lack of convergence, the salon bickered bitterly over his paper. Members disagreed over his claim that methods of argumentation have improved. One was struck, reading papers from the 1960s and 1970s, by how poorly reasoned they were. Another had precisely the opposite reaction to older papers, they seemed smarter than newer ones. As the conversation unraveled, my mates seemed increasingly glum, with good reason. If philosophers can't agree on anything after millennia of arguing, why bother?

After this session, I wrote a series of blog posts that asked: What is philosophy's point? Sure, it can be fun, especially if you get paid to do it, but if it cannot tell us what is or ought to be, what good is it? Philosophy does the most good, I proposed, when it counters our terrible desire for certitude. Playing off Chalmers's phrase "negative progress," I called the kind of doubtful inquiry I had in mind negative philosophy. I also meant to evoke "negative theology," which describes God as indescribable. After posting these thoughts on my blog, I waited for philosophers' effusions of gratitude to come gushing in.

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Owen Flanagan, when we first met, struck me as unusually sensible, and genial, for a philosopher. It was 1994, and we were both at the big consciousness shindig in Tucson (the same one where I first saw Koch speak). We spoke on a sun-drenched patio outside the conference center, water splashing in a nearby circular fountain. Flanagan had coined the term "mysterian" to describe those who claim consciousness will never be cracked. The term was inspired by the 60s rock group Question Mark and the Mysterians, authors of the hit song "96 Tears."

Flanagan was not a mysterian. He thought we could understand the conscious mind by studying it from the inside as well as outside, supplementing objective investigations of brains, minds and behavior with

“phenomenology.” That is philosopher-speak for the study of subjective experience.

I liked Flanagan’s approach to mind, and I liked Flanagan, maybe because we have similar backgrounds. We both came from in Irish Catholic families in New York City suburbs. Making small talk, we discovered that his wife Joyce and I grew up in the same Connecticut town, and I knew her family slightly.

Flanagan is a big-picture philosopher, who has written a dozen books on consciousness, morality and the meaning of life. My favorite is The Problem of the Soul, which he intended for non-philosophers. In an autobiographical section, he traces his philosophical obsessions to his religious upbringing. By the time he was seven or eight, he was beginning to think that the Church’s moral rules were nutty. If he has a sinful thought about a girl and a car runs him over before he confesses to a priest, God will torture him eternally? That can’t be right.

After he lost his faith, Flanagan remained fascinated by morality. Where does it come from? How do we decide what’s right and wrong? On the first day of his first college philosophy course, his professor said, “Plato posits the Good.” “I did not know what ‘posited’ was,” Flanagan recalls, “and I had never heard the definite article stand before the word ‘Good’—which I rightly heard as capitalized. But I was thrilled, captivated and hooked.”

Science became Flanagan’s polestar. It hasn’t explained everything, he acknowledges in Problem of the Soul, not by a long shot, but it has explained enough to validate materialism. Everything in the universe, including us, consists of physical stuff ruled by physical forces. God didn’t design us, natural selection did. We are animated meat, and when we die we die, that’s it.

That doesn’t mean there is no morality or meaning. Yes, natural selection made us innately selfish, but it also made us loving, compassionate, empathetic and concerned with fairness, because these tendencies helped our ancestors pass on their genes. If you define morality as caring for others, we are innately moral. Reason, Flanagan says, can refine and reinforce our moral instincts. It can help us see that our wellbeing depends not only on the wellbeing of our immediate kin, who carry our genes, but of all humans and even all of nature.

If you abandon belief in God and heaven, Flanagan says, you still

have a lot to live for, like love, family, friendship, beauty and the chance to make the world a better place. You can live a good, meaningful life. But "if you want more," Flanagan warns, "if you wish that your life had prospects for transcendent meaning, for more than the personal satisfaction and contentment you can achieve while you are still alive, and more than what you will have contributed to the well-being of this world after you die, then you are still in the grip of an illusion. Trust me, you can't get more."

And you do trust Flanagan, because he doesn't browbeat you the way some hard-core atheists do. He comes across as humane, modest, down-to-earth. Sensible. And yet when The Problem of the Soul was published in 2002, Flanagan's life was a mess. He was struggling with his own private problem of the soul.

That same year, we both attended a workshop on evolution and the meaning of life at Esalen, a neo-hippy resort in California. I asked Flanagan about his wife, Joyce, just to make conversation, and he said they had split up. I expressed the obligatory sympathy. I don't recall prying for details, but Flanagan said a brain tumor, combined with medications, had affected his behavior in ways that undermined his marriage. Here is how I recall reacting:

A philosopher who specializes in mind and morality gets a brain tumor that makes him behave badly! Owen, this is fantastic material! You can be your own experimental subject! You can write about the mind-body problem from first-person and third-person perspectives! Think of what you can do with free will! You can get into whether the end of your marriage was your fault, or your tumor's fault!

Flanagan, who fortunately is an easy-going, twinkle-in-the-eye kind of guy, smiled and shook his head in response to my outburst. The "material" was still too raw, he said, and writing about it now might hurt his ex-wife and children. Maybe someday.

When I came up with the idea for this book, I immediately remembered Flanagan. I called him and told him about my project. I asked if he was ready to talk, on the record, about his brain tumor, divorce and other troubles, and how they might have affected his views of the mind-body problem. Yes, he said, he was ready. I flew to North Carolina to talk to him a few months later. I thought Flanagan would be the easiest of my subjects to write about, but he turned out to be one of the hardest. Whenever I thought I had him figured out, I spotted a contradiction or omission in my

understanding. It was almost as though I were trying to figure out myself.

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Flanagan, who has taught at Duke for decades, picked me up at the Rayleigh-Durham airport on a chilly winter day. He was dressed with the shabby-gentility of an academic. Jeans, sneakers, down vest over a sweater. He had a goatish, gray-ginger beard, and hair that floated like mist above his head. We chatted about our divorces and kids as we headed to the National Humanities Center, just a few miles from Duke. Flanagan was in the middle of a year-long sabbatical at the center. He was trying to finish his magnum opus, a work charting the many varieties of morality.

The Humanities Center, white and otherworldly, looks like a spaceship that crash-landed in a Carolina pine grove. Flanagan led me to a table in an airy atrium/dining area ringed by skylights, conference rooms and offices. He was raised Catholic, so he is trained in the arts of guilt and confession. But as we sat across from each other—my recorder, red light gleaming ominously, on the table between us—he seemed nervous. When I asked if he preferred someplace more private, he shook his head. No, this spot is fine, he's just gathering his thoughts.

To ease him into the interview, I reminded him of the story he told me in 2002 about his brain tumor. Perhaps we should start with that. As I spoke, Flanagan kept repeating or finishing my phrases. "Story," "tumor," "start with that." A symptom of empathy, impatience, anxiety, all the above. For years, he was reluctant to tell his story, because he didn't want to hurt his family. "As I get further and further along, I'm able to tell it."

But first he needed to give me a little background. Catholicism was one important part of his upbringing. Another was drinking. His father, who headed a successful accounting firm in New York City, "would come home every night and drink his white drinks, his cocktails. When I was 18, he taught me how to make a martini." Owen and his five siblings grew up to be heavy drinkers.

He realized he had a problem as early as 1981, when he was teaching at Wellesley College, and his first child, Ben, was born. When he first saw

Ben in the hospital, Flanagan felt overwhelming love. Eating dinner that night with his parents, who had come to town for the delivery, he looked at his mother and thought, “Holy shit! You felt towards me the way I feel towards Ben!”

He spent the next day with his wife and parents in the hospital. “I’m in the zone of one of life’s greatest goods, which everyone says is a certifiably great human experience that you should love and treasure,” he recalled. But toward evening he wanted a drink, and he became annoyed that he couldn't easily slip away to get it. His son’s birth had become “a fucking inconvenience.” He had enough self-awareness to be appalled at himself. Did he get the drink? Yes, Flanagan nodded, he got the drink.

In 1987, his youngest brother, who had been drinking, died in a solo driving accident. Flanagan identified the body in a morgue. Shaken, he gave up alcohol for the sake of his children. Six years later, he was still sober, and life was good. He had a solid marriage and two great kids. He was teaching at a prestigious college, building his reputation as a philosopher. Then, shortly before he moved from Wellesley to Duke, something strange happened.

“One day I woke up and there were no longer any sexual qualia in the world,” Flanagan said. “Qualia” is philosophical jargon for subjective sensations. It wasn’t just that Flanagan didn't feel horny. He could scarcely remember what it was like to be horny. Normally, his sexual response was determined by the external stimulus—this woman attracts him, that one doesn’t—but now stimulus was irrelevant. Lust was an alien concept. “It was like if color vision disappeared,” he said. “The world was asexual to me.”

Alarmed, he saw a doctor, who pressed him on how he felt. Flanagan replied: Imagine you are lying on a bed in a hotel room watching the news on television, and Marilyn Monroe, at her most luscious, walks into the room and begs you to make love to her. You would tell her to move, because she is blocking the television.

Normally lean, Flanagan had gained weight, although he hadn’t changed his diet and ran almost every day. Blood tests revealed that his testosterone was extremely low and prolactin extremely high. Prolactin is a hormone that, in excess, suppresses libido. An MRI scan confirmed the physician’s suspicion: Flanagan had a prolactinoma, a benign pituitary tumor that suppresses testosterone and elevates prolactin. Most such tumors are asymptomatic, but they can cause weight gain and loss of libido, Flanagan’s

symptoms.

Although he lacked sexual desire, Flanagan had the desire for desire. He wanted his libido back, for the sake of his marriage, if nothing else. Surgery was too risky, because it "could turn you into a hormonal disaster." The doctors prescribed Dostinex, a drug that keeps the pituitary gland from producing prolactin, and a testosterone gel that he rubbed on his upper back.

His hormone levels gradually returned to normal, and the tumor stopped growing. Flanagan and his wife resumed sexual relations, but his desire remained low, and he felt anxious and depressed. "I was scared of dying," he said. "I was scared because I didn't think I had enough money saved up to put Ben and Kate through college. I was scared about my relationship with Joyce."

He saw a psychiatrist, who put him on the anti-anxiety drug Klonopin and the trendy new antidepressant Prozac. Flanagan had discussed Prozac's philosophical implications in a public event with psychiatrist Peter Kramer. In his 1993 bestseller Listening to Prozac, Kramer claimed that Prozac could make patients "better than well." Actually, the drug was no more effective than older antidepressants, and it suppressed libido.

When Flanagan's sexual problems persisted, a psychiatrist in North Carolina, to which he had moved, put him on another antidepressant, Wellbutrin, to "jumpstart" his libido. Flanagan learned later that this prescription was a mistake. Taking Wellbutrin on top of Prozac is now "completely prohibited, because it produces exactly the effect it produced in me."

After a week on Wellbutrin, Flanagan started to feel good. Very good. He went to a book-launch party at Duke, at which champagne was served. At that point, Flanagan had been sober for seven years. "If you asked me then if Owen Flanagan would take another drink, I would say, 'Absolutely not, he has no interest in drinking.'" But when someone handed Flanagan a glass of champagne, he drank it without hesitation.

Flanagan became entranced by a young female editor at the party. "She looked like the most beautiful woman in the world, and I wanted her." By the end of the day, Flanagan had begun an affair with her. Over the next 10 days, he became obsessed with high-end cars, toward which he had previously been indifferent. He started visiting Mercedes, BMW and Jaguar dealerships. "They would lend me cars for weekends or overnight, so I could

ride them around.” After buying a BMW, he bought a house he didn’t need either, a rental property. One day he became so obsessed by the actor Andy Griffith that he drove to his childhood home in Mount Airy, North Carolina. Meanwhile he kept drinking and seeing his lover.

Telling me all this, Flanagan was cool, just reporting the facts. I asked how he felt emotionally during this period. “I was bullet proof,” he said. “On top of the world.” His libido had come roaring back. His lover, the editor, lived with another man, and Flanagan enjoyed trysts at her house. “I loved the danger.”

He kept performing his academic, spousal and parental duties as if nothing had changed, even as he pursued his new projects. “I’m signing papers, I’m moving $40,000 to buy this cheap house.” Now and then, for example while driving to see Andy Griffith’s home, Flanagan realized “there might be something a little bit wrong.” For the most part he was clueless. “I just lost a layer of self-knowledge, because it didn’t seem abnormal."

Flanagan squirmed in his chair, as though debating whether to tell me something. He said that during his “bullet proof” period, he told his wife about his affair and blamed it on her. He was having sex with another woman because she, Joyce, bored him. “It didn’t seem wrong to me to say that,” Flanagan said to me, his voice eerily bland. “My reflective moral self just seemed to evaporate.” The moral philosopher had lost his sense of right and wrong.

Flanagan was planning to go to Australia, where he would be a visiting scholar. His wife and daughters had planned to accompany him, but Joyce decided they would stay behind. After Flanagan arrived in Australia, he stopped taking Wellbutrin, which he suspected of causing his abnormal behavior. Gradually he realized “the gravity of the harm” he had done to his wife.

Telling me all this, Flanagan’s discomfort was evident. We had moved to his office now. He sat in a chair behind his desk, and he kept shifting in his seat. He said he felt hot. Was I hot? I was fine, I said.

After sipping from a water bottle, Flanagan resumed his story. When he returned from Australia, Joyce took him back. She accepted that medications had triggered his affair, which was over. “She’s a forgiving person,” Flanagan said.

The problem was, he couldn’t stop drinking. On many mornings he

woke up vowing never to drink again, and within an hour he would swallow three 16-ounce beers to steady his nerves. Throughout the day he would "maintenance dose." He had another affair, and this time his marriage ended. Joyce moved to Maine. They remain friends. "I think neither Joyce or I are constitutionally people who hold grudges."

He went to Alcoholics Anonymous, on and off, and quit drinking, on and off. He kept drinking even after being jailed for driving drunk. "The problem isn't stopping, it's staying stopped. I couldn't stay stopped." I had mentioned to Flanagan that I quit drinking when my marriage ended. He asked how hard it was for me. Did I experience withdrawal? The "heebie jeebies"? No? Well, he did. He went through detox five times. He craved booze so much that he ruled out suicide, because he couldn't drink if he was dead. Flanagan smiled when he said this, but he wasn't kidding.

He stopped drinking in 2007, more than a dozen years after the glass of champagne at the book-launch party. Does he ever crave a drink now? No, Flanagan replied, but he didn't really crave one before he had that glass of champagne at the book party. "I'm more diligent now," he said.

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As Flanagan told me about his tribulations, I felt uneasy. If there is such a thing as smiling Irish eyes, Flanagan has them, plus dimples that deepen when he grins, which is often. He wants you to like him, and he succeeds. He's charming not in an overbearing, alpha-male way, but in a light-hearted, life-of-the-party, liked-by-all-the-gals-and-guys way. Life's not so bad, his personality implies. Let's enjoy it, enjoy each other, as best we can.

A darker self peeks through now and then. Flanagan has a habit, almost a nervous tic, of offsetting compliments—of others and of himself—with criticism, and vice versa. Consider how he described Joyce, his ex-wife, early in our conversation. "Joyce was a very reserved—wonderful human being—reserved, shy person. And I like them high heels and low maintenance." Chuckle. "She was definitely low maintenance, in that she definitely wasn't a complainer. But once in a while I would drink to excess,

and she would complain about it."

Note Flanagan's insertion of "wonderful human being" into his description of his ex-wife as "reserved," which comes close to "dull." His wife "wasn't a complainer," except when she was. With the "high heels and low maintenance" line, Flanagan was mocking his sexual shallowness, but bragging too.

Mulling over how Flanagan combines strokes with jabs, I realized we share this trait. I'm a judgmental jerk who likes to be liked, so I disguise my criticism of others with irony or humor. Very passive-aggressive. And like Flanagan, I puff myself up and deflate myself, sometimes simultaneously.

Flanagan and I have other things in common. We're "aging hippies"—his phrase—lapsed Catholics, and ex-drinkers with a taste for philosophizing. There are differences between us. I am more agnostic about supernatural matters than Flanagan, perhaps because psychedelics have loosened my grip on reality. I don't believe in God, ghosts or souls, but I'm not adamant in my disbelief.

Another difference is that I'm not nearly as charming as Flanagan. That's not modesty, just a fact. At the Humanities Center, Flanagan bantered gracefully with a receptionist, cafeteria workers and several other scholars. Later, he charmed baristas, mechanics and a waitress at a cafe, auto-repair shop and restaurant. I could no more duplicate his performance than I could walk on my hands.

Flanagan's social skill makes him a little self-conscious. In Problem of the Soul, he notes that many people perceive him as "lively and outgoing, even charismatic." But this, he suggests, is not his true self. Deep inside "there remains a very shy, somewhat withdrawn person." Flanagan is trying to tell us, and perhaps himself, who he really is. He is the shy guy, not the "charismatic" guy. He is the good Catholic boy, who isn't mean to innocent people.

But surely Flanagan sometimes wonders who he really is. Natural selection designed male primates for one purpose, spreading their seed. Maybe the true self of all men is beastly Mr. Hyde, not civilized Dr. Jekyll, and we are all brainwashed into being good by parents, nuns, priests, teachers. Maybe if we had no fear of social disapproval and punishment, we'd be really bad.

But I'm getting ahead of myself. One of my goals, while interviewing

Flanagan, was to determine how, or whether, his professional training helped him cope with his personal trials. Did philosophy do him any good? If not, what is its point? I have come up with five ways in which his mind-body expertise might have served him. I call them “Self-Mastery,” “The Buddhism Gambit,” “My Tumor Did It,” “What Moral Rules?” and “Going Meta.” Below I consider them one by one.

Self-Mastery

Self-mastery was the original point of philosophy. As Socrates said, “examining myself and others is the greatest good.” Socrates, Confucius and other ancient sages assumed that thinking hard about what is right and wrong will help you achieve self-knowledge and self-control and become a better, wiser person.

Philosopher Eric Schwitzgebel and a colleague recently tested this claim by examining the behavior of philosophers who specialize in ethics. They included self-reported data from philosophers as well as information from historical archives. Behaviors included staying in touch with your mother, responding to student emails, talking during someone else’s lecture, voting, meat-eating, blood donation and joining the Nazi party. The last category was a swipe at Martin Heidegger. None of the questions addressed adultery, unfortunately.

Schwitzgebel and his colleague found that ethicists are ethically “indistinguishable” from other professors. Ruminating over these findings, Schwitzgebel expresses disappointment with moral philosophers, including himself. He notes that he and his colleagues see ethics as a set of “abstract problems” with “no bearing on day-to-day life.” If ethicists draw upon their training, they do so to justify dubious actions. They “excel at rationalization and excuse-making.”

None of this was news to Flanagan. When I asked if philosophers’ expertise makes them wiser, he shook his head before I completed the question. “Absolutely not,” he said. “Academics—philosophers, let’s just say—are more ill-formed than your average person.” Smiling, he told me a joke. How can you tell the difference between a philosopher and a mathematician? The philosopher looks at your shoes when he’s speaking to you. I looked puzzled, and Flanagan explained that mathematicians look at their own shoes while speaking to you.

The Buddhism Gambit

Buddhism is one of the oldest methods of self-mastery. Flanagan became interested in Buddhism in college, and in 1991 he participated in a meeting with the Dalai Lama and other Buddhists in India. He was intrigued by their claim that meditation helps control anger and other negative emotions.

Flanagan has meditated for decades, because it makes him feel good. “I’ve done a lot of meditating,” he told me. “I’m actually skillful at some of it.” He was fascinated by research on how meditation can alter your brain and mood and potentially make you very happy. But he accused some meditation researchers of being “snake-oil salesmen” who exaggerate its benefits. Meditation is far from a panacea. For a dozen years, it couldn’t save Flanagan from himself.

Although Flanagan prefers it to Catholicism, the religion in which he was raised, he can be quite critical of Buddhism. When I asked if he believes in enlightenment, the state of supreme wisdom and bliss that Buddha and other sages supposedly achieved, Flanagan grimaced. I might as well have asked if he believes in Bigfoot.

In his book The Really Hard Problem, Flanagan describes Buddhist methods for cultivating compassion as “brainwashing.” In The Bodhisattva’s Brain he remarks that “many western Buddhists I know are not very nice, both more passive-aggressive and more narcissistic than other types I prefer.” I circled this passage and wrote “Yes!!!” in the margin. I’ve always felt that the link between meditation and morality is overrated.

My Tumor Did It

If Flanagan couldn’t stop himself from behaving badly, his expertise in the mind-body problem could at least have suppressed his guilt. An advantage of this option is that it can be applied retroactively.

Flanagan’s life dramatizes biology’s power over us. He could justifiably assert that when he misbehaved, he was not himself. He was under the influence of a brain tumor, medications and a genetic predisposition to alcoholism. Clearly he wasn’t himself when he was cruel to his wife, any more than when he bought the BMW or drove to Andy Griffith’s birthplace. None of this was his fault. He didn’t possess sufficient free will. Chemistry trumps morality.

In Problem of the Soul Flanagan notes that the concept of free will assumes we have self-knowledge and hence control over our actions. This

assumption is at odds with what science and common sense tell us. We are animals, physical creatures ruled by a host of biological and environmental forces. We can know ourselves only dimly, at best.

But Flanagan does not let himself off the hook. He rejects hard-core determinism. Just because we cannot achieve complete self-knowledge and self-control doesn't mean we can't achieve any. Flanagan believes in choices, self-control, moral responsibility. And alcoholism isn't like cystic fibrosis, a disease over which we have no control, or even schizophrenia.

Flanagan also denies that the self is nothing but an illusion. That position, he argues, leads to absurdities, such as elimination of distinctions between novels and biographies, or between lies and honesty. He notes that an alcoholic often lies to others and to himself about his drinking. "This would not matter if the self were entirely fictional," Flanagan comments drily, "but it obviously does matter."

What Moral Rules?

Flanagan could have rationalized away his guilt by arguing that there are no absolute moral rules. For example, when he told his wife he cheated on her because she bored him, he was being honest, and honesty, you could argue, trumps kindness. No less an authority than Kant contended that lying is never ethical.

Other philosophical big shots assert that all our notions of right and wrong are petty bullshit. They advocate a kind of moral nihilism, in which there is no good or evil, anything goes. "There are absolutely no moral facts," Nietzsche declares in Twilight of the Idols. "What moral and religious judgments have in common is belief in things that aren't real."

Buddhism has a strain of moral nihilism too, as Flanagan has pointed out. Buddhism's doctrine of impermanence is consistent with a life of pure pleasure-seeking. That explains why some legendary Buddhist sages flout conventional moral rules. They get drunk, seduce other men's women, fight, even kill. So why should Flanagan feel bad about screwing around and saying mean things to his wife? From the vantage of infinity and eternity, his worst sins vanish into insignificance. Nothing matters.

And yet Flanagan does not, cannot, take advantage of these philosophical excuses. He knows that right and wrong exist, even if philosophy can't define them in absolute terms. Perhaps Godel's incompleteness theorem has an ethical corollary: Even if we can't prove it,

we know in our hearts that some acts are wrong, and we feel shame.

Going Meta

Going meta means looking at your own experiences objectively, as material for intellectual analysis. You stand back and think, Hmm, interesting. Going meta has helped me deal with painful episodes in my life, like depression and divorce.

Flanagan has advocated a meta-ish approach to the hard problem. Scientists should combine objective studies of brains and minds with phenomenology, the exploration of subjective experience. Oliver Sacks employed this method in The Man Who Mistook His Wife for a Hat and other books, which tell the tales of people afflicted by strokes, tumors and other disorders. Flanagan's pituitary tumor turned him into his own neurological case study: The Man Who Lost His Libido, Found It Again and Became an Andy Griffith Fan.

But Flanagan had a hard time seeing his troubles objectively. When his brain tumor deleted his libido, part of him found his symptoms interesting, at first. But he couldn't simply stand back and think, Cool phenomenology! He wasn't an expert on consciousness learning what it feels like to have a brain tumor. He was a man, a husband and father who was frightened, and depressed. Ultimately he might as well have been a plumber as a philosopher.

The same was true of his ethical struggles. When he felt irritated that his son's birth was making it hard to get a drink, he couldn't marvel, like Walt Whitman, at his multitudinous selves. He couldn't look at himself as The Man Who Loved Booze More Than His Wife and Newborn Son. He was ashamed, not fascinated, because his behavior was "ugly and weird." He felt shame later, too, when his drinking and philandering brought an end to his marriage.

Catholicism is criticized, justly, for excessive shaming, especially when it comes to sexual behavior that violates Church rules, like homosexuality and pre-marital sex. But shame can be "an appropriate thing to feel," Flanagan said, if it motivates you to behave better. Flanagan defined shame as "feeling like a bad person, not the person you want to be."

Flanagan cannot shake his shame for his cruelty toward his ex-wife, especially when he blamed her for his cheating. This, of all his misdeeds, seemed to haunt him most. "There is this person," he said, "a good Catholic

boy, who still believes, and always did believe, you shouldn't hurt people, especially good people, who don't fuck you over."

Philosophy didn't save Flanagan's marriage or, for years, help him stay off booze. It couldn't help him achieve self-mastery, or relieve him of guilt. But it still did Flanagan a lot of good. Throughout his ordeals, he kept philosophizing, thinking, talking, teaching, reading about the mind-body problem. He wrote five books during his troubles! Without philosophy, who knows? Flanagan might still be drinking, or dead. Writing about how life has no transcendent meaning gave his life meaning.

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After confessing his sins, Flanagan seemed to relax, like a man with a root canal behind him. We chatted about consciousness, the mystery that first brought us together back in 1994. Flanagan remained confident that science will solve the hard problem. "I am very anti-mysterian," he said. There is "some kind of explanation to be given." After science has explained consciousness in physiological terms, he said, people might stop seeing consciousness as weird.

That outcome, I confessed, would disappoint me. In fact, I hoped philosophers would point out the inadequacies of all explanations, so consciousness remains weird. Flanagan smiled. He agreed that philosophy can provide a service by reminding us "how amazing and bewildering the whole fucking thing is." He fluttered his hands around his head. That his brain, he said, produces "the amazing Technicolor aspects of experience, my love, my hates, my worries, my anxieties, my aspirations, the whole… It's unbelievable!"

Flanagan still has dark moments. Although he insists that a scientific, materialistic worldview need not be "disenchanting," he feels disenchanted now and then. "I think, Fuck it, rage at the universe." But for the most part he feels pretty good, physically and mentally. He is sober, and happily re-married. He still has the pituitary-gland tumor. He treats it by popping a pill and rubbing testosterone gel on his pelt every day. "I am a performance-enhanced philosopher," he said.

He has become calmer and more patient, perhaps because he's older. "The flames of passion and desire burn less brightly," he said. He thought of himself as "a reasonably worthy human project that didn't fuck up the world." He had made "a little, tiny contribution" to the philosophy of mind, morality and meaning, "and that feels good."

Smiling proudly, he pointed at a big stack of paper on a table beside me. It was his new book, The Geography of Morals, which seeks common ground between diverse moral perspectives. It combines insights provided by evolutionary psychology and other fields with cross-cultural comparisons of moral customs. "I love seeing the way other people have put together meaningful lives."

Writing the book helped him figure out what really matters to him. "Nothing deep, existentially, but what are the most important things?" He settled on a few simple components of a good, meaningful life. They include "friendship, love, good relations," "being there for friends and loved ones," "having some integrity," "knowing some stuff" and "not being a dick."

When we left the Humanities Center, Flanagan drove us to his favorite café for espresso. Later we walked around a park adjoining the Duke campus. As young women jogged past us, glistening with sweat, we gossiped about prominent intellectuals mired in sexual scandal, yet more evidence, as if it were needed, that erudition does not inoculate you from foolishness.

Back at Flanagan's house, I met his second wife, Lynn, and their three dogs. One kept pestering me to pet him by nudging me with his snout. Lynn was going through an identity crisis, trying to figure out what really mattered to her, and what she should do next. She had been in the restaurant business, and now she was working as a volunteer in an animal shelter, because she loved animals. She had brought these three dogs home from the shelter.

Flanagan had mentioned earlier that the dogs were complicating a planned move to Stanford, where he was going to be a visiting scholar. He didn't josh Lynn the way he had other people we met that day. He treated her delicately, hesitantly. By the time he dropped me off at my hotel that night, I felt affection for him, too much for my purposes. I thought, How can I write about this man without being a dick?

I was still wrestling with this dilemma a year later when The Geography of Morals came out. Its big theme is that we shouldn't blindly accept the morals drummed into us by our families and cultures. We should

expand our sense of right and wrong by seeing it from as many points of view as possible, including science, philosophy, the arts and non-western cultures.

Flanagan accepts that evolution bequeathed us our morality, such as it is. The Good, far from existing in a Platonic realm, or in the mind of God, is just a product of our genes' mindless compulsion to propagate. But he knocks Darwinians who suggest that socialism is doomed to fail because it runs counter to our selfish nature. Surely, he says, we can create a much better world—more fair, peaceful and free—than ours.

We should reject moral relativism, Flanagan writes, the idea that "Hitler wasn't bad, just different." But we should also resist the temptation to claim that our moral rules have the authority of scientific or mathematical truths. "The key move," he writes, "is one of humility." Humility does not come naturally to us, because natural selection designed our minds to "react quickly and decisively" in social situations. "This might make you feel cocky, confident and assured that you see things correctly," Flanagan writes. "Doubt yourself," he advises.

Flanagan is an exemplar of the doubtful mode of inquiry that I call negative philosophy. His intellectual modesty, his constant hedging, his oscillation between praise and criticism, of himself and others, is a matter of style as well as substance. It is probably a congenital trait as much as the product of rational deliberation. He was "timid" as a child, he said, and his adult troubles have reinforced his acute sense of the limits of human self-understanding.

Whatever the source of this quality, I admire it, and I wish there were more of it in the world. When I teach, I'm always telling my students, in one way or another, Doubt yourself. But doubt can only help us so much. If you see someone drowning, or if you are drowning yourself, doubt won't do you much good. Flanagan's life demonstrates that truth.

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A few years before I started this book, I decided I had to write a novel, or try, before I die. I came up with a story that I titled The Optogenetic Bodhisattva. The hero is Eamon Poole, a young science writer living in New

York City in the not-so-distant future. Eamon is afflicted with sweaty, heart-pounding panic attacks, which strike him with increasing frequency. Doctors can't figure out what's wrong with him, and the medications they prescribe do no good.

Desperate, Eamon turns to an underground brain hacker he has written about, Bjorn. Bjorn soups people up with optogenetic brain implants, which consist of viruses and micro-lasers. The viruses make the subject's brain cells sensitive to light, so the micro-lasers can manipulate the brain and hence mood with pulses of light. Optogenetics is a real technology that enthusiasts think might someday eradicate mental illness. I doubt the therapeutic potential of optogenetics, but I love its metaphorical sheen.

Bjorn tests a new implant on Eamon. It tweaks his genes in ways that boost secretion of dimethyl tryptamine, DMT, a psychedelic that occurs naturally in the brain (this is a real thing too). In a basement lab in Brooklyn, Bjorn knocks Eamon out and slips the optogenetic package over the top of his eyeballs and into his frontal cortex (again, transorbital brain surgery is an actual method).

When Eamon wakes up, he feels really, really good, blissful, giddy. The boundary between himself and the rest of the world feels porous. When he looks into Bjorn's eyes, streamers of light flow back and forth between them. Everything seems marvelous, amazing, Technicolor. He feels in his bones the improbability and absurdity of existence. He smiles constantly, laughs frequently. Eamon has achieved enlightenment, as I imagine it. My description of his state of mind is based on my readings of the mystical literature and psychedelic experiences.

Fearlessness, I've always assumed, is a key component of enlightenment, so I made Eamon fearless. Just as Flanagan's tumor deleted his libido, Eamon's implant erased his fear. He cannot even remember what it was like to be afraid. Fearlessness gives him a kind of super-charged free will. He is still bound by the laws of nature, but within those physical boundaries he has infinite degrees of freedom. His radiant demeanor also makes him charismatic. Women and men are drawn to him.

So what does Eamon do, besides giving up science writing? (I love what I do, but no one would believe a story about a guy who can do anything and chooses to write about science.) Does he devote himself to helping others? Does he seek power, money, sexual conquest, all the above? Does he

live alone in the woods, where he can contemplate the clear light of the abyss? Does he become a self-help guru? Run for President?

Eamon is exhilarated by his freedom, but I, his all-too-anxious creator, was confounded. Without fear, there can be no courage, without courage, no character. Self-doubt, shame, conscience are side effects of fear. So I thought. A life without fear is like a life without gravity or friction. It's too free. Lacking the resistance of fear, your actions might become impulsive, random, bizarre. I couldn't decide whether Eamon would be good, bad or just weird. I couldn't figure out Eamon Poole, my fictional doppelganger, so I set aside The Optogenetic Bodhisattva.

Now I'm trying to figure out Owen Flanagan. In the mid-1990s, after he was diagnosed with a brain tumor, medications made Flanagan temporarily fearless. He felt "bullet proof." He lost his conscience, his self-doubt. He started drinking and cheating on his wife, and he did impulsive, random, bizarre things, like buying a house and car he didn't need and visiting the home of Andy Griffith.

Flanagan's fear and conscience eventually returned. He quit drinking, renounced his wild ways, married again. Those were sensible things to do. If he hadn't quit drinking, he might have ended up unemployed or dead. But what if he could have been sustainably, competently fearless? Maybe that life would have been a lot more fun.

Anyone who tracks the spirituality racket knows that many supposedly enlightened gurus resemble psychopaths. They are fearless, charismatic, amoral. Take Chogyam Trungpa, a Tibetan Buddhist llama who came to the west in the 1960s and became a popular guru. He wrote best-selling books on spirituality and founded the Naropa Institute. People I respect have assured me that he was the wisest person they have ever known, but he was a promiscuous drunk and bully who died in 1987 of liver disease.

Some bad gurus are probably just con men taking advantage of spiritual seekers' desperation and gullibility. Others, I suspect, are genuine mystics, who have gone super-meta, like Siddhartha, rising far above the hurly-burly of life and seeing it from the perspective of eternity. You can react to this mystical experience in two very different ways. You might see each individual creature as precious. You cherish all sentient things and yearn to ease their suffering. This is the path of the saint, savoir, bodhisattva.

Or you might think, Nothing lasts, nothing matters. The suffering of

everyone on earth, or everyone who has ever lived, is infinitesimal, compared to eternity. A human life has no more value or meaning than that of a cockroach. You don't give a shit about the Holocaust, or Syrian kids blown to bits by American bombs, let alone one woman's hurt feelings.

The cases of Eamon Poole and Owen Flanagan have helped me discover a contradiction in my philosophy. If I had to choose a supreme value, it would be freedom. Life has no meaning unless we are free to choose. Fearlessness should be desirable, too, because the more fearless we are, the more free we are. But fearlessness can turn us into psychopaths, who do not give a shit about anything but our own pleasure.

If you don't fear death, the judgment of God or of other people, if you know—really know—that nothing matters, what, if anything, restrains you? What keeps you from hurting others? Reason? No, because reason confirms your mystical intuition that all things pass, there is no divine justice, nothing matters.

If reason can't guide you, you're left with your innate tendencies. If you have a strong tendency toward empathy and compassion, you become a good guru, a bodhisattva, who cares for others. If you have a strong innate desire for sex, power and high adventure, you become a bad guru, de Sade in a saffron robe. Your "choice" comes down to the genes your parents bequeathed you.

In one of his dialogues, Socrates argues with Glaucon about the true nature of men. Glaucon imagines a magic ring that makes men invisible, so they can do anything and get away with it. He asserts that men who found such a ring would be bad, really bad. They would kill other men and take their property and their women. Socrates says a wise man would resist such temptations, because true freedom means not being enslaved by your appetites.

I'm not so sure. I am a conventional, cowardly goody-goody. When I watch shows in which the hero is a criminal, like The Sopranos or Breaking Bad, I think, What a stressful life! I couldn't live like that. But part of me envies the outlaws. I think, That would be true freedom. The rest of us are puppets, slaves of convention.

I sometimes wonder, What would it be like to be a psychopath, unencumbered by fear or compassion? What would it be like to be one of those crazy, charismatic gurus who drink and fuck with abandon and are

worshipped for their holiness? If there is no God, and no Good, everything is permitted.

I'm not sure where this leaves me. I still think the world could use more freedom and less fear. But if we lose all our fear, we might lose our self-doubt, and become self-righteous dicks, or worse. We might lose our sense of wonder, because what is wonder but doubt with positive valance? One outcome of this rumination is that I no longer fantasize about a cure for fear, a neural or genetic tweak that makes us feel bullet proof, so fearless we cannot even remember what it was like to be afraid. I fear that if we lose our fear, we might become monsters. That might be who we really are.

Chapter Seven

# The Novelist: Gladsadness

Before I met Rebecca Goldstein, I worried she might be snooty. She looks glamorous and brainy in author photos, with long blond hair and an austere expression. She's an adept in physics and mathematics with a doctorate in philosophy from Princeton. She has won acclaim for her highbrow fiction and quasi-fiction, including The Mind-Body Problem: A Novel, 36 Arguments for the Existence of God: A Work of Fiction, Plato at the Googleplex and biographies of Spinoza and Gödel, two of history's knottiest thinkers. She's spoken at Davos, given a TED talk, won a MacArthur "Genius" Fellowship. In 2015, Barack Obama gave her the National Humanities Medal in a ceremony at the White House. Come on, the woman is entitled to be snooty.

Then I met Goldstein in the fall of 2015 at "The Weirdness of Consciousness," an event at Union Theological Seminary in New York City. Robert Wright, a journalist and old friend of mine, organized "Weirdness." He loves to dwell on how "weird" consciousness is, hence the title. The announcement stated: "Science can explain the body, but can it explain the mind? The failure of scientists and philosophers to reach a consensus explanation of consciousness has led to a revival of interest in theories once widely dismissed, such as panpsychism."

Wright chatted with David "the hard problem" Chalmers and Goldstein. She didn't try to dazzle us with eloquence and erudition, although she was in fact eloquent and erudite. She seemed—no, she was—fascinated by the hard problem, panpsychism and the philosophical implications of quantum mechanics. She was eager to hear what Chalmers and Wright had to say and to share her thoughts with them and the audience. The ideas mattered.

At Barnard she studied mathematics and physics, which she thought would eventually account for everything, including the mind. Then riding a New York City subway car, puzzling over a tract by Hobbes on how matter makes a mind, she had an epiphany. "I'm thinking, 'Whoa! How does matter

in motion give rise to’”—she framed her head with her hands—“‘this! All of this!’ And it just hit me… And it was the most exciting intellectual experience of my life. It was like, ‘Oh, God. It’s not all physics, certainly not physics as we know it.’”

At Princeton she studied under Thomas Nagel, whose 1974 essay “What is it like to be a bat?” reinforced her dissatisfaction with conventional, materialist accounts of consciousness. Few other philosophers at the time were interested in consciousness, and some viewed it as a pseudo-problem. That is one reason why she abandoned academic philosophy and turned to fiction as a means of exploring mind-body conundrums.

She thought science would eventually validate panpsychism. Physicists would show that consciousness lies latent within all matter, just as the exotic quantum properties charm, color and strangeness do. “I’m still a materialist,” she said, “but matter is a hell of a lot more interesting than we used to think it is.”

Goldstein charmed me. Slight, almost ethereal, she listened with fierce concentration, which intensified when she spoke. She leaned into her points, brow knitted, hands thrusting and swiping, as if rearranging invisible ideas. She had one of the night’s biggest laugh lines. It occurred during an exchange over zombies, hypothetical beings that act like humans yet lack an inner life. Goldstein said she suspected certain philosophers, especially hard-core materialists who insist that consciousness is no big deal, of being zombies.

After the public event I joined the speakers for dinner, and I ended up sitting next to Goldstein. She was the same one-on-one as on stage, earnest to the point of nerdiness, endearingly so. When I said I shared her obsession with the mind-body problem, she said she couldn’t understand why everyone isn’t obsessed, because it’s about who we are, really, and who doesn’t care about that?

Binging on her writings afterward, I discovered that Goldstein can be hard on snooty intellectuals. The Mind-Body Problem: A Novel, published in 1983, satirizes academics who view the life of the mind as a competition, who care more about status and clever one-upmanship than truth. But Goldstein is tender toward her targets, too, and she conveys what it feels like to be a smart, ambitious young woman obsessed with the mind-body problem.

The heroine of Mind-Body Problem, Renee Feuer, adores her father, a devout Jewish cantor, but she cannot believe in his God. She pursues a doctorate in philosophy at Princeton, where she discovers, to her dismay, that her colleagues disdain the mind-body problem as trivial or nonsensical. Renee bitterly faults them for "not only refusing to consider the mysteries of existence (which is a position I can understand) but adamantly denying that there are any (which is a position I cannot understand)."

Renee craves understanding of bodies and minds, especially her own, and she wants to be desired, loved, respected. She wants her life to mean something, to matter. But does she matter mostly as a mind or body? As an attractive girlfriend, wife or mistress? An object of desire? As an intellectual trying to solve the mind-body problem? If she isn't a genius, what is the point of being a philosopher? Of being anything?

At Princeton, what matters is intelligence, as defined by academic success, and "the people who matter most, the heroes, are the geniuses." Renee venerates genius too, and she even marries one, mathematician Noam Himmel. But she cannot accept a value system that ranks some lives above others. The monotheistic faiths tell us we all matter to God. If God doesn't exist, how do we matter?

Goldstein returned to this question decades later in Plato at the Googleplex: Why Philosophy Won't Go Away. The book rebuts the claim of Stephen Hawking and other physicists that science has rendered philosophy obsolete. We need philosophy more than ever, Goldstein argues, to tell us what science means. She imagines Plato on a modern book tour, holding his own in encounters with software engineers trying to automate ethics and brain scientists seeking the neural basis of reason and emotion.

But Goldstein knocks the ancient Greeks for their snootiness, their insistence that you must achieve greatness as a leader, warrior, artist or sage for your life to be meaningful. The Greeks insisted that one "must live so that one will be spoken about," Goldstein writes. "It is, in the end, the only kind of immortality for which we may hope." Goldstein calls this stance the "Ethos of the Extraordinary." You have no hope for an extraordinary life, needless to say, if you are a slave, or a woman. Plato ranked philosophers above all others, and he even asserted, via Socrates, that "the unexamined life is not worth living."

In one scene in Googleplex, Plato's media escort, Cheryl, rips him for

suggesting that “someone who doesn’t have a higher-than-average IQ can’t live a worthwhile life.” She wraps up her diatribe, “A person is a person. Everybody’s life is just as important as anybody else’s, and if you don’t know this simple truth for yourself, then just go ask them.” Plato, after listening carefully to Cheryl, says softly, “Brava.” Cheryl, suspecting condescension, says, “What, are you kidding me?” Plato replies, “Not in the least, that was magnificent.”

I love this scene. Goldstein simultaneously bashes Plato and redeems him, by showing him learning from a woman. But when I recall it now, it’s tinged with irony. Goldstein, who assures the rest of us that we matter, isn’t sure how much she matters.

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Goldstein lives in Boston, but when I met her she was teaching at New York University. I interviewed her twice, at an NYU apartment for visiting professors and in an NYU high-rise. She seemed slightly different each time, as though changes in locale shifted her personality settings. Or were my settings shifting? The apartment where I first interviewed her was devoid of character. We sat opposite each other at a black circular table. The air around us felt charged, as if Goldstein were emanating an ionizing force, stronger, paradoxically, because she seemed so frail. Or so I scribbled in my notebook.

Goldstein confirmed that she has much in common with Renee, the narrator of Mind-Body Problem: A Novel. Goldstein’s father was a Jewish cantor, born in Poland, who struggled to support his family. Even in a wealthy New York suburb, being a cantor “was a really meager living.” Her father taught bar mitzvah lessons, “but he would never charge people, so they would give him what they wanted.”

After her father died in 1980, neighbors approached Goldstein to tell her about his “secret acts of charity.” He “would have given away his last crust of bread. He was just a very other-worldly, beautiful man.” He remains her “hero,” the person “I most admire in all the world.” For her father, faith meant cultivating knowledge and virtue, which brings you closer to God.

As a girl, Goldstein started asking her father how God could allow the Holocaust and other horrors to happen. “He said, ‘We don’t understand.’ He spoke about free will, people are responsible for their own actions. But it was just too much.” Reading critiques of religion by Bertrand Russell and other skeptics convinced young Rebecca that we don’t need God to be good or have meaningful lives.

She continued observing Jewish rituals for decades. When she was 19, she married Sheldon Goldstein, a quantum theorist and orthodox Jew. He, like her father, asked her to behave as if she believed. She complied until they were divorced in 1999. By then she had given birth to two daughters.

Pretending to believe wasn’t difficult for Goldstein, because she has never been an “exultant nonbeliever.” She loathes the kind of atheist whose rhetoric implies, “Look how much smarter I am than all these believers.” Her loss of faith was painful, “a severance from a tradition I love.” She remains fascinated by, and sympathetic to, “the mystical worldview, the religious worldview.”

Atheists fail to appreciate our primal human need to matter, Goldstein said, a need that probably has deep evolutionary roots. “That’s a condition of human life. Everybody has it.” When we think we don’t matter, we suffer. Religion satisfies this instinctual need. “The Abrahamic religions really solidly grounded your sense of mattering,” Goldstein said, rapping the table. “You matter to God. He’s watching you.”

Unfortunately, the concept of a personal God is hard to reconcile with science. “We know we don’t matter to the universe in a religious way, where we cosmically mattered.” A great achievement of Spinoza and later philosophers was to make the case that all lives matter, whether or not God exists. Kant articulated this principle when he argued, as Goldstein put it, that “every person has to be seen as an end in his or her self, and not a means to an end.”

She noted that evolution has embedded moral impulses and intuitions, including a sense of fairness, in our genes. “This might sound crazy, and I might take it back, but I don’t think morality is actually that complicated,” she said. “Our moral emotions, of outrage, and indignation, that’s there in two-year-old kids. ‘It’s not fair, my sister got more than I did!’” Morality consists in recognizing that others deserve to be treated fairly, too.

Goldstein recalled being at a party when a physicist trying to talk to

someone beside her picked her up and moved her aside. She thought it was funny, but another man was outraged that she had been treated so disrespectfully. “So you think, ‘What is it about me that entitles me to be treated with respect and dignity?’” Goldstein said. “If you’re going to make these demands, you have to universalize it to everybody.” She laughed. “Voila! There’s morality!”

Why did she turn to fiction to explore mind-body problems? Why not stick with philosophy? Academic philosophy did not treat her well, Goldstein replied. She suffered from two disadvantages: her interest in consciousness, which was considered flaky, and her gender. “I thought naively after leaving Orthodoxy I would never encounter sexism again.” Some of her Princeton colleagues attributed her interest in the mind-body problem to her “religious past” and accused her of being a “mystic.” Goldstein found these reactions “demeaning and infuriating.”

After graduating from Princeton, she got a job teaching at Barnard. But shortly after Mind-Body Problem was published, she was denied tenure. Devastated, she decided to become a full-time writer of “philosophy fiction,” which would “take philosophy just as seriously as good science fiction does.” Plato was a precedent. Although he disparaged poetry, Plato invented characters, dialogue and elaborate metaphors, like the parable of the cave, to make his points.

Goldstein found philosophy fiction liberating. “I don’t have to argue it, or footnote it. I can just say, ‘Here is a possibility. Try to experience this.’” She loves how unpredictably readers react to her work. “I get letters from readers and I go, ‘Whoa! You thought the book was that?’” Her “loose and ragged hold” on her own subjectivity, Goldstein said, allows her to inhabit characters like Hedda, heroine of The Dark Sister, a “belligerent feminist” over six feet tall. Writing about Hedda, Goldstein found herself “strutting through my little neighborhood, picking fights.”

As a novelist, she conceives ideas that wouldn’t have occurred to her as a conventional philosopher. One is “the mattering map,” which Renee, the heroine of Mind-Body Problem, invents while brooding over the meaning of life. The map is a vast mental projection of all the things that matter to people, that make their lives worth living. Each individual’s location on the map, Goldstein writes, “is determined by what matters to him, matters overwhelmingly, the kind of mattering that produces his perceptions of

people, of himself and others: of who are the nobodies and who the somebodies, who the deprived and who the gifted, who the better to have never been born and who the heroes."

What matters to you might be what matters to Goldstein and other experts in this book, pondering who we are. It might be other forms of mathematical, scientific, philosophical and artistic truth, or enlightenment and other spiritual goals. It might be love, marriage, raising children, helping others less fortunate than you, saving animals, saving all of nature. It might be food, sports, fashion, or the attainment of wealth, power and status, worldly success. It might be thrill-seeking via sex, extreme sports, travel, drugs, violence.

"I never would have discovered [the map] if I hadn't been thinking like Renee Feuer," Goldstein said. To her delight, scholars have embraced the mattering map as a celebration of human diversity, of the many ways we live meaningful lives. Many people, unfortunately, see mattering as a competition, with winners and losers. "I'm richer, smarter, more beautiful, taller," Goldstein said. "I'm the right race, the chosen people, and gender—or in my case the wrong gender." Competition can be fun, and productive, as long as it does not become an end in itself, a blood sport.

Fiction can help us appreciate that everybody matters, everybody is entitled to create her own version of a meaningful life, Goldstein said. She likes blending history and fantasy, scholarship and imagination, the real and the make-believe. "When people ask me now about my next book—fiction or nonfiction—I just want to say I don't recognize the distinction any more." Fiction is especially appropriate for exploring the mind-body problem, "because what is a novel but descriptions of the consciousness of the various characters?"

Those trying to solve the mind-body problem "should be throwing everything that they have" at it, drawing upon all modes of knowledge. "Scientists should be philosophically literate, and philosophers should be scientifically literate, and everybody should be literarily literate." Goldstein chuckled. One reason the mind-body problem is so difficult to solve is that people have emotional reactions to it. "Temperament really determines a lot of our orientations toward this question in particular." Some thinkers are "allergic to mystery. They break out in hives."

This aversion could explain why hardcore materialists downplay

consciousness and even deny that it exists. “It’s crazy, right? There can’t be consciousness, because otherwise the universe would be mysterious!” Other scholars, especially in the humanities, revel in mystery, the more the better, and they seem to hope that science will never explain the mind.

Goldstein rejects both these views. Like Christof Koch, Alison Gopnik and other subjects of this book, she thinks consciousness is a profound and solvable mystery. Saying that “matter has not given up all its secrets,” she hoped that scientists will eventually discover a true theory of everything, which accounts for matter and consciousness. The theory must explain “why these had to be the laws of nature,” and it “has to explain us, it has to explain consciousness.” Such a theory “would be amazing, a tremendous triumph.”

This is the sublime truth that Spinoza sought. In Betraying Spinoza, Goldstein describes the philosopher’s personal life in ways that, she suspects, would have horrified him (hence the book’s title). She imagines what it was like to be a 17th-century Jewish sage expelled from his faith for heresy. Spinoza objected to Judaism’s insistence that Jews or any other people are special, or “chosen.” He sought a God, a truth, that is eternal and universal, impersonal and objective, that transcends the messy ephemera of his personal life, and of human life in general. We can rise above our suffering, our mortality, by contemplating this sublime cosmic principle.

Goldstein identifies with Spinoza and his quest for absolute truth, which reflects his faith in reason. She would be appalled if the search for ultimate laws culminated in a “dead end” where—she clapped her hands —“that’s it! These are the laws and there’s no more explanation.” She shook her head. “Somehow that seems like a violation of reason.” And yet reason suggests that such a theory might be unattainable. That is an implicit theme of Goldstein’s biography of Gödel, Incompleteness. Gödel’s incompleteness theorem proved, as Goldstein puts it: “In any formal system adequate for number theory there exists an undecidable formula—that is, a formula that is not provable and whose negation is not provable.”

Goldstein calls the theorem one of three “theoretical cataclysms,” along with the uncertainty principle and relativity, that rocked the foundations of the “exact sciences” in the 20th century. Gödel did not prove that proof is impossible, Goldstein emphasizes, any more than Einstein showed that everything is relative or Heisenberg that nothing is certain. But

Gödel's theorem casts doubt on the possibility of a theory that can explain everything, including itself.

The tragic irony of Gödel's life is that he was afflicted with severe paranoia, which Goldstein calls "rationality run amuck." Convinced that someone was trying to poison him, Gödel stopped eating and starved to death. His incompleteness theorem, Goldstein writes, is "darkly mirrored in the predicament of psychopathology: Just as no proof of the consistency of a formal systems can be accomplished within the system itself, so, too, no validation of our rationality—of our very sanity—can be accomplished using our rationality itself."

Gödel's interests went beyond mathematics. He had a "fascination with examining the meaning and implications of man-made laws that faintly mirrored his interest in the eternal laws of logic," Goldstein notes. While studying to become a U.S. citizen in the 1950s, Gödel told a friend that he had discovered a logical contradiction in the Constitution, which made it possible for American democracy to descend into tyranny. Some paranoia is justified.

When I asked how she felt about humanity's future, Goldstein frowned. We have progressed morally over the past few centuries, she said. Democracy and rights for women and other historically oppressed people have spread, and war and other forms of violence have declined. But she was "horrified" by recent counter-trends in the U.S. and elsewhere. Competitive mattering has run amok. Unrestrained capitalism "makes some people feel as if they don't matter in this world," she said.

"A society that doesn't take care of its most vulnerable is an unfit society." Goldstein thought we were done with the "moral mistakes" of "racism and sexism and xenophobia and America-first," all of which assume that some lives matter more than others. But "oh my God here it is again!" She sighed heavily. "The fact that demagoguery can get such a hold of people is terrible to me, and depressing."

Is optimism a moral requirement for an intellectual? Goldstein glanced at the ceiling, mulling the question over. "No," she said with a grim smile. "Realism is a moral requirement for an intellectual."

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Spinoza once described his quest this way: “After experience had taught me that all the usual surroundings of social life are vain and futile; seeing that none of the objects of my fears contained in themselves anything either good or bad, except in so far as the mind is affected by them, I finally resolved to inquire . . . whether, in fact, there might be anything of which the discovery and attainment would enable me to enjoy continuous, supreme, and unending happiness.” Spinoza wanted to escape the cave, to become enlightened.

When I asked Goldstein if she believes that truth—knowledge of yourself and the world—can make you happy, she smiled ruefully. “It hasn’t been my personal experience.” I hesitated before asking the obvious follow-up question, because it felt intrusive, even more than asking about sex. Are you happy? seemed too blunt, so I asked, Do you consider yourself to be a happy person?

Goldstein has a habit of speaking with conviction and then pausing to second-guess herself. Sometimes she affirms her utterance, with a nod and a “Yeah.” Sometimes she qualifies or retracts it. She displayed this trait in response to my query about her happiness. Her immediate reaction was to shake her head vigorously and say, “No.” She does not consider herself to be a happy person.

You seem happy, I said.

“I’m happy when I don’t think about myself.” She reflected. “I tend to obsess about certain things. I’m happy when I’m just thinking, lost in a project. That to me is happiness. But…” Pause. “Like many people, I have a lot of demons.”

A real reporter would have jumped on that admission, pressing for details. Instead I asked, Isn’t philosophy supposed to be consoling?

“It is consoling,” she said, especially Spinoza’s philosophy, which posits that human reason is a microcosm of divine reason, which in secular terms is equivalent to the laws of nature. The payoff of such a worldview is “seeing yourself in relation to the biggest picture possible, and losing yourself in the big picture.” She spoke slowly, cautiously. But the big picture can be terrifying, I said. “It can be terrifying too,” she murmured. “It can be

terrifying too."

She reflected again. "Maybe I should say I'm a happy person. Most people who know me well think I'm a very happy person, so maybe that's the best judge, right?" Her husband, psychologist Steven Pinker, whom she married in 2007, thinks she is "an extremely positive, happy person, and he probably knows me better than anyone else. So… Yeah."

You are not the best judge of your own virtue. Others must determine whether you are good or bad. But surely you are the best judge of your happiness, right? Maybe not. Maybe you can be happy and not know it. People with the neurological condition called blindsight insist they cannot see. They are subjectively blind. But toss a ball to a blindsighted person, and her hand will dart out and catch it. Jab a finger toward her eye, and she will flinch.

Maybe blindsight has an emotional analog. You feel sad, glum, blue, but an objective observer would say that you're actually happy, joyful, glad. Call it bluebliss. Glumjoy. Wait, I have it. Sadgladness. Of course, the converse is more likely to be true: All happiness is delusional. You think you're happy, but from an objective perspective, you're not. This would be gladsadness.

Goldstein dramatizes this condition in her novel 36 Arguments Against the Existence of God. The protagonist, Cass Seltzer, a psychologist of religion, shares traits with his creator. He doesn't believe in God, but he sympathizes with those who do, and he often doubts his own doubt. Cass nonetheless overcomes his self-doubt and demolishes the case for God in a debate at Harvard with a fearsome Christian intellectual. The audience sides with Cass, cheering his lines and laughing at his jibes.

Cass can't wait to recount his victory to his lover, Lucinda, another high-achieving academic, because he knows how thrilled she will be. As he drives home, he envisions them making love, and Cambridge, suffused with a mystical erotic glow, beams his joy back at him. When he gets home and exults to Lucinda, she receives the news of his triumph coldly. She accuses him of cruelty, of flaunting his success when he knows she is struggling in her career. To his horror, she says she is leaving him and walks out of the house.

An omniscient, objective observer, watching Cass drive home earlier, would have known that his joy is based at least in part on his erroneous belief

that his girlfriend loves him. The observer might have concluded that Cass's happiness is delusional. Cass is experiencing gladsadness. Happiness is fleeting, especially the happiness that comes from worldly success, and from erotic love. So even if Cass's girlfriend had melted into his arms that night, the omniscient observer, who can see the future, might still have concluded that Cass's happiness is delusional. After all, sooner or later Cass's love will dim, his career will slump, he'll get old and die.

And if Cass is right, and there is no God, no heaven—when we're gone, we're gone—then what was the point of his life, anyway? From this cosmically objective perspective, this view from nowhere, which is consistent with what science tells us about the world, all human gladness might appear to be gladsadness. Spinoza claimed to have found a way to be genuinely, objectively happy, in spite of death, and life's vicissitudes, but, assuming he achieved this happiness, maybe he was gladsad too.

When I asked about mortality, Goldstein replied that the death of others, of loved ones, is hard to bear. "My sister died young, that was very hard. And my dad died young, that was hard," she said. "I've lost people. I don't believe they still exist. I don't give that any degree of probability."

In her youth, she briefly confronted the prospect of her own demise. She was swimming at a beach near New York City, and a riptide started pulling her away from shore. Before a lifeguard rescued her, she was saddened but not terrified at the prospect of dying. She thought, "All things die, and this is me. There are going to be a lot of sad people, but what's to fear? You just don't exist any more." Disbelief has its consolations.

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Toward the end of my first interview with Goldstein, her voice grew hoarse, her energy waned. She watched me anxiously as I stuffed my recorder, notebook and pen in a backpack. "Is this enough?" she asked. "Do you have enough?" I could have asked her the same question.

When we spoke a year later, I asked what she meant when she said she had "demons." She replied, "I think it might be a little too deep to…" She paused. "I think they have to do with these issues of mattering." She is

“prone to shame,” she said, as a result of her Orthodox upbringing. “When I get some indication that some people disapprove of me, or think I’ve done something wrong, or think my writing is dreadful,” she hears voices from her past. Goldstein scrunched her face into a theatrical scowl and said in a harsh, hectoring voice, “Why do you do this? Why do you put yourself out there? Who are you to do this kind of thing?’” She smiled wryly. “That is the voice in which my demons speak.”

As Goldstein imagined Spinoza’s inner life, I’ll imagine hers. What is her Rosebud, the key to understanding her psyche? There are plenty of candidates. Her beloved father. Her tortured relationship with Judaism, and with philosophy. But I nominate an unusual, recurrent experience in her childhood. Before I tell you about her experience, I need to remind you of the one I describe at the beginning of this book, when as a boy walking to a fishing hole I suddenly became self-aware.

Before describing it in this book, I’ve never really talked about this incident. It means a lot to me, but it’s hard to explain to others. And so I was stunned when I came upon a passage in 36 Arguments Against the Existence of God in which the hero, Cass, recalls a recurrent “metaphysical seizure” or “vertigo” that struck him in childhood. Lying in bed, he was overcome by the improbability that he was just himself and no one else.

“The more he tried to get a fix on the fact of being Cass here,” Goldstein writes, “the more the whole idea of it just got away from him.” Even as an adult, Cass kept asking himself, “How can it be that, of all things, one is this thing, so that one can say, astonishingly, ‘Here I am’”? This passage popped off the page at me. Cass was expressing how I felt as a boy muttering, “I’m me.”

Had Goldstein given her own childhood experience to her fictional character Cass? Yes, she confirmed, Cass’s eerie “vertigo” was hers. Lying in bed as a girl she would wonder, “What is it about me that makes me me… What makes me this and not that?” Goldstein’s voice was hushed, her eyes had a faraway look, she seemed transported back into that state. Underlying the feeling, she said, was the “scary” sense of the “sheer contingency” of reality.

What Goldstein calls “contingency” is randomness, improbability, arbitrariness—or what I like to call weirdness. Why this, of all things? And the weirdness of your own, individual self reflects the weirdness of existence.

Why anything? Goldstein suspects people who are “truly bothered by philosophical problems” are more likely to have experienced the vertigo, and I suspect she’s right. If a mystical vision conveys oneness, the confrontation with contingency is anti-mystical, but it feels equally revelatory. Thou art not that.

This intuition underlies Goldstein's hope that science will one day solve the mind-body problem, the central riddle of existence. She yearns for a revelation that can dispel that terrifying sense of contingency she felt as a girl. She wants science to provide objective, empirical assurance that she, we, all of us were meant to be, had to be. We’re necessary. We matter. But I doubt science can give Goldstein what she seeks. Unlike Christof Koch and Stuart Kauffman, her fellow panpsychists, Goldstein does not feel at home in her self, or in the universe. She has never lost that childhood sense of weirdness. She feels, deep down, like a stranger in this world.

Spinoza sought to escape contingency through contemplation of the eternal, impersonal order of nature, which today we would identify with the laws of physics. Here’s the catch. You need to be extraordinary, blessed with a high IQ, to appreciate general relativity and quantum mechanics, or Spinoza’s philosophy, for that matter. The sublime happiness he offers is accessible only to a lucky, elite few. And even then your appreciation of quantum field theory will probably not protect you from heartbreak, from the contingencies of life as a mortal being, unless you were a cold, snooty jerk to begin with.

Goldstein is not a cold, snooty jerk. She travels through life with scant protection from the elements. She is not the kind of intellectual who looks down on non-intellectuals. She doubts the value of her own work. She doesn’t believe in God or an afterlife. She fears that, in the long run, none of us really matter. Her outlook is so stark, so stripped of comforting illusions, that she doesn’t even view death with horror. The prospect of nothingness comforts her.

Estrangement has an upside. Being at home in the world can blind you to it. Most of us don’t see, really see, the weirdness of things, or, if we catch a glimpse, we quickly forget it, even though it's always right there in front of us. And what Goldstein called her “loose and ragged hold” on her self makes it easier to imagine being someone else. Goldstein reminds me of Marianne Moore’s poem Nevertheless by. It begins:

you've seen a strawberry
that's had a struggle; yet
was, where the fragments met,
a hedgehog or a star-
fish for the multitude
of seeds.

Goldstein has turned her struggles into art, “philosophy fiction.” She makes ideas come alive by embedding them in characters buffeted by lust, ambition, loneliness, fear, the craving for love, for the world’s approval. But is this enough?

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Philosophers, like it or not, have much in common with poets and other artists. Emily Dickinson and William Carlos Williams don’t impart truth, empirical or ethical. They don’t say, This is how things are, or ought to be. They say, This is how things might be. Philosophy does this too, even when it doesn’t intend to. Plato, who denounced rhetorical trickery, advanced his arguments with stories, the meanings of which can be murky. I like teaching the parable of the cave to freshmen not because it’s clear but because it isn’t.

Art doesn’t give us truth in the sense that science does. Art jolts us out of our perceptual doldrums and helps us see life anew. Good philosophy does that too. I can still remember the exalted vertigo I felt reading Thus Spoke Zarathustra for the first time, or Tractatus Logico-Philosophicus. Do I get Wittgenstein? Of course not. What Feynman said of quantum mechanics applies to Wittgenstein. If you say you understand him, you don’t. Confronting his oracular utterances, I feel like Amy Adams in the film Arrival. I’m awed by my encounter with an alien intelligence, in which, if I look hard enough, I might dimly discern myself.

Conversely, some of my favorite works of art have philosophical themes. In mordant metaphysical fables like “The Zahir” and “Funes the Memorious,” Borges warns that there is such a thing as too much knowledge. Absolute truth, far from saving us, might be a black hole into which we

vanish forever. Charlie Kauffman's film Anomalisa features a depressed protagonist who sees and hears others—including his wife—as puppets with identical male faces and voices. The hero meets and falls in love, sort of, with Lisa, a woman who has her own voice and face. Kauffman's films dramatize depersonalization and solipsism so powerfully—so viscerally—that I fear for his sanity.

Goldstein's work succeeds as philosophy and art. Her fiction and quasi-fiction explore the mind-body problem more deeply than most works of science and philosophy. She achieves a deeper truth through satire and irony, through stories about real and imaginary people.

Art like Goldstein's doesn't offer the final word on anything, nor does it seek to. It doesn't aim at the truth in the sense that science and philosophy do, but that means it can offer a deeper truth, which is that there is no final truth. Reality can never be entirely captured by a novel, poem, sonata, painting, film. Like the Gödelian sentence "This is a lie," art thrusts truth at you and snatches it back in the same instant.

Art solves, sort of, the solipsism problem, and the mattering problem, by yanking you out of yourself and showing you the world through someone else's eyes, someone who yearns to be happy, to be good, to matter, just as you do. Some of my favorite explorations of the mind-body problem simply call attention to it. They remind us how odd it is to be a sentient hunk of meat, matter that yearns to matter. They reveal the strangeness of thoughts and emotions. They don't explain, they illuminate, in ways that amplify the strangeness. My pal Bob Wright is right about consciousness. It's weird.

Take Ulysses, which imagines what it feels like to be a young writer who loves Ireland but yearns to escape it. Or a Jewish ad salesman who fears his wife is cheating on him. Or that same wife, who cheats on her husband even though she still loves him, and falls asleep remembering the first time they made love. Goldstein, after I gushed about Joyce, nodded. She feels the same way about Proust.

Psychologists and other scientists can probe subjective experience, sort of, but novelists help us grasp "what is it really like to be a conscious thing."

The Beautiful can lead us astray. That is why Plato excluded poets from his perfect world. Art can incite hatred. In college, I saw saw Triumph of the Will, the Leni Riefenstahl documentary about a Nazi rally. Rationally,

I was repulsed. Viscerally, Riefenstahl's music and imagery stirred me. When Hitler hailed the hordes of adoring, beautiful men, women and children, part of me wanted to jump to my feet and cheer.

Humanities professors preach that great art makes you a better person, but that, like many platitudes we professors spout, is false. Stalin was a voracious reader of literature, including poetry. He once told a group of writers, "The production of souls is more important than the production of tanks.... And therefore I raise my glass to you, writers, the engineers of the human soul." By the time he died, Stalin had slaughtered almost as many people as Hitler.

Great art is morally ambiguous, or amoral. And it cannot satisfy those who seek permanent, final truth, an "Aha!" that lasts forever, that makes us truly glad, because its revelations are self-immolating. Art might not satisfy Goldstein herself, who wants science to solve the mind-body problem once and for all, but it has its consolations.

At the end of The Mind-Body Problem, Renee says if an "angel of God" appeared and offered to answer any question, she would ask for the solution to the mind-body problem. What if her dream came true? How would the angel answer? Would he hand her a monograph on integrated information theory, or strange loops? A Gödel-style proof that materialism cannot account for consciousness, or that the debate over free will cannot be resolved? No. The angel would open his mouth and sing a song so beautiful that Renee is overcome with awe, terror, ecstasy.

After the revelation fades, as it must, Renee cannot describe it to herself, let alone to others. She hoped illumination would bind her more tightly to the world, but she feels, if anything, more alone, just as she did when she was a child pondering the weirdness of her self, of everything. The happiness she yearns for still eludes her. But for a moment she felt the answer, she knew, and that's something. And as she strains to recall her encounter, a few vague, fragmented memories arise, memories of the angel's song, of what she felt as she listened. Renee opens her laptop and starts writing, trying to convey that feeling, even though she knows she'll fail, in her own eyes if not the eyes of others.

# Chapter Eight
# The Evolutionary Biologist: He-Town

In June 2017 I traveled to Jamaica to interview Robert Trivers, who owns a house on six wooded acres on a hilltop near the island's southern coast. Unwisely, perhaps, I talked my girlfriend, whom I'll call Emily, into coming with me. She rolled her eyes when I called Trivers one of the greatest living scientists. You say that about everyone you interview, she said. What sold her on the trip was the prospect of relaxing on a Caribbean beach. We arrived at Trivers's home early one evening and departed the next afternoon for a resort in Negril. During that time, my reactions to Trivers swung wildly between admiration, pity and fear. They still haven't fully stabilized.

A couple of scenes to convey the man's complexity. Giving me and Emily a tour of his land, Trivers pointed out a bulbous, spikey, bright green fruit dangling from a tree. It looked like the business end of a medieval mace. That tree is Annola muricata, called soursop by locals. Natural selection gave the fruit its distinctive shape for easy night-time detection by bats, which devour the fruit and excrete the seeds. Clever, eh? Trivers makes soursop tea by boiling the leaves in water and adding sugar and milk. The brew calms the nerves and helps you sleep.

We paused before another tree with bronze bark and dark, glossy leaves. A pimento, Trivers said, which produces allspice. The tree is unusual because it is dioecious, plants are either male or female. Most flowering plants are monoecious, each plant has male and female organs and hence can pollinate itself. The dioecious system is much less efficient, because male trees contribute so little to reproduction. Gazing fondly at the pimento, Trivers mused, "That these things survive in competition with other species is something of a mystery."

Later, when I was alone with him in his living room, Trivers displayed knowledge of a different kind. If someone pulls a knife on you, he informed me, cross your arms in front of you, like this. Wait for your assailant to make his move, knock his knife hand aside with a forearm and punch him or go for his throat. He showed me a chokehold he learned from

his pal Huey Newton. Gripping the back of my windpipe between his thumb and fingers, Trivers pinched until I winced. He apologized for hurting me, but did I understand how it would feel if he had squeezed hard? This hold can incapacitate any man, no matter how big and strong, and kill him if you keep squeezing. Massaging my throat, I indicated my appreciation for the lesson by nodding and grinning like a submissive ape.

Before I return to this tropical tale, some background. If you believe in science, as I do, you accept that natural selection created us. Whatever mind-body story you favor—integrated information theory, strange loops, Bayesian models, quantum consciousness, psychoanalysis—you must acknowledge that we are organisms designed for one purpose, making copies of ourselves. That, according to evolutionary biology, is who we really, truly are.

I nonetheless have a deep-rooted bias against biological explanations of human behavior. I fear they will discourage us from trying to create a better world by convincing us that the way things are is the way they must be. Historically oppressors, notably white, western, upper-class males, have invoked evolutionary theory to justify racism, sexism, imperialism, militarism and rapacious capitalism. Hierarchical social structures and inequality are inevitable. Those in power deserve it, because they are fitter.

Even Darwin, enlightened for his era, confused what is with what ought to be. In The Descent of Man he wrote that man displays “a higher eminence, in whatever he takes up, than woman can attain--whether requiring deep thought, reason or imagination.” This sort of thinking is not as overt as it once was, but it endures. It is invoked to explain why males have dominated science, mathematics and the arts.

Many evolutionary hypotheses deserve to be derided as fanciful “just-so stories,” if not racism and sexism in scientific guise, but not the hypotheses of Trivers. In 1971 he took on one of biology’s deepest mysteries in “The Evolution of Reciprocal Altruism.” Altruism consists of helping others at a cost to yourself. It is the essential moral act. Altruism toward those who share our genes is easy to explain in Darwinian terms, but why are we kind to non-kin, including strangers? Why jump in a pond to save someone else’s drowning kid? Why does my niece, a Harvard Law School graduate, work as a public defender in North Carolina, helping poor people accused of crimes, when she could make much more money as a corporate mercenary?

Trivers conjectures that natural selection instilled compassion and other moral emotions in us because our ancestors--over time and in the aggregate—received tit-for-tat benefits from acts of generosity. The emotions are instinctual, the end result of millennia of calculations by natural selection. But altruism could only propagate if natural selection instilled complementary tendencies in us, such as an exquisitely honed sense of fairness. If someone is kind to us, we feel grateful, and we want to reciprocate. If we are mean to someone who has treated us well, we feel guilt. We become outraged if we sense that someone is "cheating," taking advantage of our kindness or that of others.

The emotions and instincts that nudge us to be kind, and to repay acts of kindness, might be absolutely sincere. But we are not just creatures of emotion and instinct. We also consciously, and rationally, help others with the expectation of reward. Worse, we deceive others about how generous and kind we are. We fake being good to get the benefits without the costs. Trivers backs up his thesis with elegant mathematical modeling, based on game theory, and examples of altruism-related behaviors in birds and fish. His reciprocal-altruism model, he points out, provides insight into "friendship, dislike, moralistic aggression, gratitude, sympathy, trust, suspicion, trustworthiness, aspects of guilt, and some forms of dishonesty and hypocrisy." Trivers isn't bragging, just stating a fact.

In two subsequent landmark papers, "Parental investment and sexual investment" (1972) and "Parent-offspring conflict" (1974), Trivers explains why hatred and cruelty abound even within families. Parents share no genes with each other and only half their genes with offspring. A female can only produce offspring every nine months. A male can in principle have virtually infinite offspring, but he cannot be sure a child is his. Given these genetic conflicts of interest, it is not surprising that parents sometimes become bitter enemies and even abandon offspring. These papers could serve as an appendix to What Maisie Knew, in which parents behave atrociously to each other and to their daughter, and to Alison Gopnik's books on kids.

"The human altruistic system is a sensitive, unstable one," Trivers writes. That could be the greatest understatement in the history of science. The ideas of Trivers were rapidly popularized by other biologists, notably Edward Wilson in Sociobiology and Richard Dawkins in The Selfish Gene (for which Trivers wrote the forward). A 1977 TIME Magazine cover story

on sociobiology hailed Trivers as "the boldest in applying the gene-based view to humans." I wasn't jiving when I told Emily that Trivers is a big deal.

Psychologist Steven Pinker says Trivers has "provided a scientific explanation for the human condition: the intricately complicated and endlessly fascinating relationships that bind us to one another." Pinker calls Trivers "one of the great thinkers in the history of Western thought" and an "under-appreciated genius." Trivers is "under-appreciated" at least in part because he is a difficult man, a hot-tempered, bipolar anti-authoritarian with a taste for booze and weed. He has often, by his own admission, sabotaged his own career.

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I first crossed tracks with Trivers in 1995, when I attended the annual conference of the Human Behavior and Evolution Society in Santa Barbara, California, a pep rally for evolutionary psychologists and social scientists. Prominent Darwinians were there, including Dawkins and Pinker. I was chitchatting outside the conference hall when someone pointed out a scruffily bearded guy in a knitted cap and tinted glasses smoking a joint with two other men. That's Bob Trivers, my informant said. I approached Trivers, identified myself as a reporter for Scientific American and asked for an interview. He eyed me suspiciously and waved me away.

My report on the Evolution Society meeting was published in Scientific American in October 1995. I gave the article the admittedly provocative title "The New Social Darwinists." Social Darwinism was a noxious 19th-century ideology inspired by evolutionary theory. Here is an excerpt from my introduction:

"Watching [Darwinians at the conference] bonding, bickering, preening, flirting and engaging in mutual rhetorical grooming, one must concur with their basic premise. Yes, we are all animals, descendants of a vast lineage of survivors sprung from primordial pond scum. Our big, wrinkled brains were fashioned not in the last split second of civilization but during the hundreds of thousands of years preceding it… But just how much can Darwinian theory tell us about our modern, culture-steeped selves? Even

enthusiasts admit that the field has much to prove before it can shake the old complaint that it traffics in untestable ‘just-so stories’ or truisms.”

And so on. I didn’t quote Trivers, but I mentioned his “bracingly cynical” theory of reciprocal altruism. I tried to be fair. I acknowledged that evolutionary theory offered intriguing ideas about our tastes in beauty and morality, and about behavioral differences between males and females. But I suggested that its hypotheses were short on evidence, and they often mirrored social stereotypes, especially about gender. After the article was published, Trivers sent me a letter. An excerpt:

“I was disappointed in your shallow piece on evolutionary psychology… Even on trivial matters you are resolutely ignorant. My reciprocal altruism paper is ‘bracingly cynical.’ Please! Do you know what the word cynical means and have you ever studied the work you so characterize? If our sense of justice evolved, as I surely believe it has, it must have done so by benefitting those possessing a sense of justice. That’s cynicism?! No, that’s logic. You are once again overwriting and underworking.

Your work reveals a recurring problem serious scientists have on the subject of human behavior. Anybody with half a brain can mock thoughts on human behavior and by leaving out the evidence and the details of the logic make any evolutionary position taken look feeble or unsupported. Why satisfy yourself with such a trivial endeavor?”

I convinced myself that Trivers’s complaints were unfair—criticizing science is my job—but the letter stung. I remembered it in 2011 when an editor at The New York Times Book Review got in touch with me about a book by Trivers, The Folly of Fools: The Logic of Deceit and Self-Deception in Human Life. The editor said the book criticized the U.S. and Israel so harshly that he and his Times colleagues weren’t sure whether to review it. He asked me to take a look at it. If I thought the book deserved a review, I could write it.

Sure, I said. I knew, before I read Folly, that I would review it. Reviewing books for The New York Times is fun and good for the career. The only question was whether I was going to give Trivers a good or bad review. Part of me wanted Folly to be bad, so I could punish Trivers for disparaging my Scientific American article back in 1995, but I found the book fascinating.

“We are thorough-going liars, even to ourselves,” Trivers declares in his preface. He argues that deceit is a “deep feature” of all organisms, an inevitable consequence of brutal genetic competition. Viruses and bacteria employ subterfuge to sneak past hosts' immune systems. Possums play possum, and cuckoos avoid the hassle of raising offspring by laying their eggs in other birds’ nests. As organisms’ strategies for deceit have grown in sophistication, so have strategies for deceit-detection. This arms race has been a major driver of evolution.

Our big brains and communication skills make us especially good dissemblers. Even before we can speak, we cry alligator tears to manipulate care-givers. As adults, we seize on facts that bolster our preconceptions and overlook contradictory data. Fooling others yields obvious benefits, but why fool ourselves? The more we believe our own lies, Trivers asserts, the more effectively we can lie to others. Our lies and illusions can have devastating consequences, from bad marriages to stock-market collapses, world wars and genocide.

As the Times editor warned me, Trivers is especially scathing toward the U.S. and Israel, which he accuses of repeatedly covering up atrocities with lies. He is hard on himself, too. He acknowledges deceiving girlfriends, family members, colleagues and himself. After being in a store, he sometimes finds items in his pockets that he has unconsciously shoplifted. He recalls walking down a street with an attractive young woman, feeling cocky, when he spotted an ugly old man walking beside them. To his shock he realized he was seeing his reflection in a store window.

I gave Folly a positive review. It ends:

“Trivers is not an elegant stylist like Dawkins, Wilson or Pinker. His technical explanations can be murky, his political rants cartoonishly crude. But Trivers's blunt, unpolished manner--which I assume is not feigned—makes me trust him more than some slicker writers… Only in one passage does Trivers strike me as insincere, when he notes how prone academics are to self-importance; one survey found that 94 percent consider themselves to be above average in their fields. ‘I plead guilty,’ Trivers adds. That, surely, is false modesty. I hope his new book gives Trivers the attention he so richly deserves.”

I described Trivers’s political discussions as “rants” not because I disagreed with them but because I knew they disturbed the Times editors.

That was cowardly on my part. After the review appeared, I considered inviting Trivers to my school to talk about Folly. I had heard rumors of misbehavior, so I checked up on him. A friend who saw him lecture in Germany said he was great, on top of his game. When I reached Trivers by phone, he said my review annoyed him, initially, but his editor convinced him he was being too thin-skinned. So sure, he'd come to my school for a modest honorarium.

In September 2012, Trivers gave a terrific talk to a packed auditorium. He got a big laugh describing experiments that revealed penises of homophobes swell in response to gay porn more than penises of non-homophobic straight men. Another hit: a video of a toddler who stopped or started bawling depending on whether his mother was in his line of sight. So young, so manipulative! He'll go far in life.

I enjoyed my day with Trivers. I liked his growly hipster patter, the way he called me "brother." He was so cool he made me feel cool. He listened carefully to what I said, and if he wasn't sure what I meant, or if he thought I wasn't sure, he demanded clarification. He had no tolerance for bullshit. I admire this trait, even when the bullshit in question is mine.

After Trivers gave his talk, we met a dozen students in my science-writing seminar. To jumpstart the conversation, I brought up the old complaint that evolutionary hypotheses are unconfirmable "just-so stories." Trivers asked for an example. As a matter of principle, I refuse to be intimidated by scientists, but Trivers's narrow-eyed gaze spooked me. I, a mere science writer, was bitching about Darwinian theory to one of the greatest Darwinians since Darwin. It was like complaining, "Well, Nils, quantum mechanics is a fine theory, but come on, we both know it's overrated." Who did I think I was?

I mumbled something about the Darwinian assumption that women are innately less promiscuous than men. Nurture, I said, could explain female coyness as well as nature. Girls learn at an early age that sex can get them in trouble. They are criticized for promiscuity far more than boys, and they run the risk of pregnancy. As I spoke, I was acutely aware of my students eyeing me. Like a pack of feral dogs watching their leader challenged by a bigger rival, they surely sensed my fear, the moisture on my brow, the tremor in my voice.

Trivers, as I recall, responded that even in societies with liberal sexual

mores and accessible birth control, females are on average less promiscuous than males. The same is true of most mammalian species, suggesting that female coyness has a biological basis. His tone was mild, and he didn’t press the point. He didn't want to embarrass me in front of my pack. I felt grateful and humiliated.

When I got the idea for this book, I naturally thought of Trivers. In his 2015 memoir Wild Life, he describes his upbringing as the child of a diplomat, his first psychotic breakdown, his passion for nature and science, his love-hate relationship with Jamaica. After visiting the island in the 1970s to study birds and lizards, he bought land there. He also married and brought to the U.S. (in sequence) two Jamaican women, with whom he had four daughters and a son. Trivers has fulfilled his biological function.

What sets Wild Life apart from most scientists' memoirs is the violence. Trivers recounts incidents in which he was robbed at gunpoint and knifepoint and fought off would-be assailants with his fists or a knife. Then there is his friendship with Huey Newton, who co-founded the Black Panthers. They met in 1978 when Trivers was teaching at the University of California at Santa Cruz and Newton was in prison. Studying for a doctorate in social science, Newton took a reading course on self-deception with Trivers. They remained close until Newton’s death in 1989. Trivers calls Newton a “warm, brilliant man” but acknowledges his “dark side.” Newton “brutally beat and murdered people of various ethnicities, sometimes for no crime at all.”

At the end of his memoir Trivers regrets his “absence of self-reflection.” I took this admission as an invitation. I would get him to reflect more deeply than he had in his memoir on his mental illness and affinity for violence. By the time I called him, he was living full-time in Jamaica. He was no longer affiliated with Rutgers, with which he had a tempestuous relationship, or any other university. He suggested we meet during one of his trips to the U.S. to give a talk or see his family. Jamaica is dangerous, he emphasized, with one of the highest murder rates in the world. Cab drivers were known to rob tourists.

I said I was willing to take the risk, and so was my girlfriend, who was coming with me. Okay, Trivers said. He would have a Jamaican friend drive us from the airport to his home, where no one would fuck with us. He has a firearm, and he has been trained in knife-fighting by a German cop who

trained other cops. Listening to him, a joke popped into my head: Who protects us from our protector?

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Trivers's house was a one-story structure with three bedrooms and two bathrooms ringed by a yard of red dirt, on which several lean mutts lounged. Trivers was thinner than when he visited my school, more grizzled, stiffer in his movements. His speech was slower and more growly. He was unshaven, his white hair cropped short. He greeted me and Emily with seemingly genuine enthusiasm and gave us a tour of his home. I had expected, and led Emily to expect, a certain level of comfort, if not luxury. That expectation, I'll just say, was not fulfilled. As we walked through the house, Emily nonetheless uttered noises of appreciation.

We paused before a wall covered with photos of women and children. Emily murmured approvingly as Trivers identified his wives, daughters and son, and a sister who had died of cancer. Pinned to another wall were newspaper photos of a muscular female athlete. Emily laughed when Trivers said that he and Roy, a Jamaican man who helps him tend his land, like strong black women.

After I asked about coffee for the next morning, Trivers took us into the kitchen and pointed out a jar of instant coffee and can of condensed milk. When Emily inquired about a can opener, Trivers grabbed a big knife and made a stabbing motion. This is how we open cans here, he said with a rakish grin. Emily smiled brightly at him, then winked at me with en eye facing away from Trivers.

He led us outside onto a small porch. Night had fallen. The jungle seethed with the music of insects, birds, frogs and humans at a nightclub down the hill. Trivers told Emily that having a female visitor was a real treat. He and his pal Roy call this place "He-Town," because women so rarely visit. I hope you won't feel inhibited here, he said to her. It was too dark for me to see if Emily was winking at me.

We settled in the living room. Emily and I sat on a rusty metal love seat, Trivers at a table with a laptop and printer. He showed us two stories he

had clipped from Jamaican newspapers, a captioned photo of a preternaturally curvaceous beauty-contest winner, and a report on the murder of a 71-year-old man. These stories, Trivers said, capture Jamaica, land of beautiful women and bad men. Jamaica would be paradise if not for Jamaicans. He doesn't say that, Jamaicans say that.

He abhorred the country's vicious homophobia. He was organizing a group to defend gay men threatened by other Jamaicans. He wasn't sure whether he and his fellow defenders should arm themselves with guns, knives or broken bottles. Nothing is scarier than a man wielding a broken bottle, he assured us.

He asked me to remind him of my book's theme. After listening to my pitch, he said he didn't see how the mind-body problem could be solved any time soon, given how little we know about the brain. "We are still weak on the biology." Neuroscientists often overstate their knowledge. Trivers was fascinated by research on lie-detection, but he doubted reports that MRI scans can detect lies with 80-percent accuracy. Lie-detection researchers are probably hyping their results—lying!--to keep funds flowing from the CIA and other agencies interested in lie-detection.

He and Huey Newton, who shared his fascination with deception, speculated that liars often give themselves away by taking too long to answer a question--or, conversely, by reacting too quickly. Once, visiting Newton in prison, Trivers asked if he was going to smoke crack as soon as he got out. No! his friend replied, whipping his head back and forth. Then Newton smiled and added, Too fast, eh? Three months later Newton was shot to death outside a crack house in Oakland.

Trivers, who has always identified himself as an evolutionary biologist, knocked sociobiology and evolutionary psychology, fields that his work helped spawn. "Sociobiology is pure bullshit," he said. Edward Wilson, often called "the father of sociobiology," is only the father of the term. "Calling it a special name and acting as though it's an independent discipline, you cut it off from its roots, its trunk!" As for evolutionary psychology, Trivers doubted a core proposition, that our minds and bodies have not evolved much since we were hunter-gatherers. In fact, Trivers said, plagues and other selection pressures can alter genes quite rapidly.

Abruptly switching topics, as he often did, Trivers revealed that he had gotten bad news that morning. A fellowship he had hoped to get in

Denmark had fallen through. He was in the market for a job, any job, at any university, no matter how humble. Surely, I said, with all your admirers, you will get a job soon. “I’ve got a few detractors, too,” he said. If 10 people gather to honor him, at least one or two are thinking, “That motherfucker shouldn't get nothin’.” He laughed grimly.

He wanted not just a job but an intellectual “community.” “I get lonely here for intellectual, you know, companionship, such as we’re having here.” He had been looking forward to hanging out with me and Emily. When we were late coming from the airport us, he feared we had decided to go straight to our resort. Emily said, We were looking forward to meeting you, too, Bob!

Hey, Trivers said to me, maybe you can get me a gig at your school! Great idea, I said, except the school just got its biggest gift ever, $20 million, from a creationist alumnus, so it might be tough getting a Darwinian like you hired. I imparted this information with a big, phony grin (although the story about the gift was true). No problem, Trivers said, grinning back at me, he’ll teach a class on creationism and slip in a little evolutionary theory. After we chuckled over that, I suggested that we hit the sack and talk again in the morning.

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I woke from fever dreams. Pale, pre-dawn light was falling through the windows. I heard noises. Trivers was up. Emily was awake too. She had slept even more poorly than I had because of the heat, bugs and barking of dogs. She was going to try to get more sleep. I got dressed, grabbed my notebook and recorder and found Trivers in the kitchen. He asked how we slept, and I said great. We settled in the living room. I had a mug of coffee, Trivers a mug of soursop tea.

As he did throughout the morning, Trivers scanned his computer for news of atrocities. Examples: A cop trying to shoot a pit bull ended up killing a child. Trivers was aghast. You can’t shoot a dog when it’s running around! He mimed the proper method for killing a bad dog. Wait for it to fasten its teeth on your leg and put a bullet through its skull. That seems sensible, I

agreed.

He read aloud another story about a Dallas officer who shot at a moving car and killed a 21-year-old woman. “These police murders gall me so much,” Trivers said. In his youth, the murder of black civil-rights activists incensed him. When all-white juries failed to convict Byron Beckwith, the white supremacist who killed Medgar Evers, Trivers thought “black people should take a page from Jewish history and send in an assassination squad.” That’s why he was thrilled to meet Newton, who shot a cop in self-defense, in the 1970s. Trivers, who briefly belonged to the Panthers, said there “is still a little bit of Black Panther in me.”

Newton was legendary for his skill with firearms. He could supposedly kill someone in an instant. “Poof! Right through the head,” Trivers said, miming a quick-draw. Newton once offered to teach Trivers how to shoot, but he “stupidly” declined. He bought a gun after men armed with knives attacked him here in Jamaica in 2008. They had probably read newspaper reports about him receiving the Crafoord Prize, a scientific honor worth $500,000. He fought the assailants off with a knife of his own. “I figured next time robbers come, they are gonna come with bang-bang, because a cutting tool doesn't work with me.” He regularly practices at a shooting range. “A gun is only good as the man holding it.”

When I raised the issue of mental illness, Trivers cautioned that he did not follow “the literature on being nuts,” but he suspected his bipolar disorder has a genetic component. His father, the diplomat, who had a degree in philosophy, “was borderline crazy but just on this side. I was borderline crazy on the other side.”

He didn’t give much credence to the old idea that genius and madness are linked. Like Elyn Saks, he saw his illness as “destructive,” not creative. “I’ve not been romantic about it at all,” he said. “You don’t learn anything when you go crazy.” His manias, which usually culminated in hospitalization, lasted for a month or two and were followed by a longer period of depression and recovery.

When he first broke down in 1964 after a bout of increasing mania and sleeplessness, he didn’t know who he was. He was hospitalized for two and a half months. Thorazine “knocked the psychosis” out of him, and a milder drug, stellazine, kept him from relapsing. In the past, after emerging from a breakdown, Trivers would go off meds, but since an episode in 2000

he has remained on Depakote and clonazepam.

Trivers has had plenty of psychotherapy, too. Its chief benefit, he said, is that “you can tell a therapist things you can’t tell anybody else. Anybody. So let’s say I did get drunk and have a homosexual experience. Am I going to tell you, my closest male friend? No. I’m embarrassed of it, ashamed of it. So there were things I did in my life, out in California, in the bad old cocaine days, idiot days, I would share with my psychiatrist.” Trivers sees a therapist in New Jersey now and then. The therapist “mostly acts as a guard against my abuse of alcohol and marijuana. He’s always more concerned about alcohol, and he’s right.” But marijuana has harmed him too, he said, by reducing his scientific productivity.

Trivers credited Freud, the father of psychotherapy, with drawing attention to self-deception, repression, projection and denial. There is “no doubt we repress certain things, deny certain things, project certain things. So Freud had insights. However.” Freud wedded these ideas to a theory of early development—the oral, anal and Oedipal stages--that he “invented out of whole cloth, probably snorting too much cocaine.”

Freud got the idea for the Oedipal complex from female patients who claimed that men had molested them when they were girls. Freud believed the women initially, then decided they were fantasizing about sex with father surrogates. “He blamed the victim,” Trivers growled, disgusted. “So now it was women wanted these relations” because of their latent desire for their fathers.

The Oedipal hypothesis is preposterous, Trivers said. Sex between closely related organisms often leads to offspring with deleterious mutations. Evolution has therefore designed humans and other animals, including birds, to avoid copulation between parents and offspring, and especially between fathers and daughters. “In organism after organism, birds and mammals, there are well-developed mechanisms to keep you and your father apart.” That is not to say incest never happens.

Trivers knocked some modern psychological claims, too--for example, that optimism, which can be a kind of self-deception, promotes a stronger immune response and other health benefits. Trivers suspected that the researchers got the causality backward. Being healthy, with an immune system “purring along at peak efficiency,” will naturally make you feel better about life. “If you're healthy, you’ll be more optimistic!”

Trivers wrote an optimism researcher to propose his alternative interpretation. “I dummied up as if I’m naïve. ‘I really enjoyed your study of such and such, interesting correlation, but tell me, you interpreted this way, couldn't it also be interpreted so and so?’ She wrote back, listen to her: ‘We have been studying this for 21 years.’ I forget how she worded the rest of it, but it was like: ‘We’ve been making this mistake for 21 years, we ain’t about to change.’” Trivers guffawed. Talk about self-deception!

He liked research linking intelligence to deception. In a study of human four-year-olds, a researcher brings a box into a room, tells the child in the room not to look inside, leaves the room and watches the child through a one-way window. Most children look in the box. Most also lie about looking, and the smarter they are, the more likely they are to lie. “120 IQ or above, you lie 100 percent of the time,” Trivers said gleefully.

Trivers wasn’t aware of good research on intelligence and self-deception. Many intellectuals, he said, probably think they are less susceptible to self-deception than non-intellectuals. They reason, “‘I’m smarter, I’ve got better insight, I can see through it better.’ All right. My answer is, ‘Yeah you're smarter, so you’re quicker at rationalizing.’” Trivers can detect and analyze his own self-deception “post-facto,” after the fact, but not “pre-facto.” He often regrets retaliating against those who have slighted him and vows not to do it again. But the next time someone pisses him off, he persuades himself that retaliation is righteous.

He recalled a 1977 spat with Paul Samuelson, a Nobel-winning economist at Harvard. (With disdain, Trivers informed me that the Nobel Memorial Prize for Economics is administered by a bank, not a scientific society.) The Harvard economics department asked Trivers to give a talk, to which Samuelson would respond. Samuelson assured Trivers his response would be “positive.”

Then TIME Magazine quoted Trivers saying: “Sooner or later, political science, law, economics, psychology, psychiatry, and anthropology will all be branches of sociobiology.” This quote apparently offended Samuelson, who attacked Trivers after he gave his talk. “I started to get up at one point and interrupt him and say, ‘Listen motherfucker.’” A colleague restrained Trivers. During this period, the Harvard biology department delayed his tenure application, and Trivers, furious, accepted a position at Santa Cruz. “I had warned them, ‘Give me tenure or I’m leaving.’ And

unfortunately I’m as good as my word.”

That was my opening, now or never. I found it “odd,” I said, that in his memoir he didn't reflect more on the “tough guy stuff.” His tendency to lose his temper, to get in fights, verbal and even physical. He could have been severely injured or killed in the fights.

“You got that right, brother,” Trivers said. He mused a moment. “Part of it was self defense,” he said. He learned to box in prep school to protect himself against bullies. His fighting has “a strong moral component,” he explained. If you are a “rabbit” and you are right, he will back down. But if he is right, even if you are much bigger and stronger, he will “probably go for you.”

But you didn’t just defend yourself, you sought out danger, I persisted. You befriended Huey Newton, an extremely violent man. What explains this fascination with violence? “Fascination I think is too strong a word,” Trivers said cautiously. And Newton’s violence was an “appropriate response to unpunished violence against black people” by police and others. Come on, I said, in your memoir you admit that some of Newton’s violence was unjustified. Surely you must have reflected on this tendency of yours.

Trivers took a big breath. “Damn. It’s a good question, man. You’re asking some good questions. And I don't have good answers. Which is, you know...” His voice trailed off. At some point during this interrogation, Trivers started moving restlessly around the room, picking up and setting down objects. Then, as if to rebut me, he confidently recounted an incident that took place in 1985 in Amsterdam. His marriage was crumbling, and he was in a foul mood. Unable to find an open brothel in the city’s red light district, he became belligerent, loudly insulting the Dutch. An “ugly” man emerged from the shadows and told Trivers that he would find him a woman. Trivers suspected the “ugly Hollander” meant to rob him or worse, but he followed him anyway, continuing to spew out insults.

When they were on the edge of a canal with no other people in sight, the Hollander, sure enough, pulled a knife. Trivers punched him, knocking him over. He planned to kill him with the chokehold that Newton had taught him, but the Hollander bolted. Trivers wrote up the incident for his memoir, but his editor hated it. “She went bonkers over the fact I was intending to kill someone. And then she said really stupid stuff, like, ‘You could have just walked away!’” Trivers mentioned the dispute to friends, and they agreed that

“if someone puts your life on line, you have every right to put their life on the line.”

But his editor was right, I said. Trivers provoked the confrontation with the Hollander and kept following him even though he suspected the man intended to rob him or worse. He was spoiling for a fight. This is just another example of his attraction to violence. “I agree with you, I agree with you,” Trivers muttered. Maybe he should address this issue in the next edition of his memoir, he mused. He sat at his desk, grabbed a pen and paper and scribbled. “’Why… not… more… conscious… re… personal… violence.” He stared at the note. “Jesus Christ, I’m scared to even answer, brother.”

Trivers announced that he wanted to give me a tour of his land. I followed him outside. His property, which from the house looked like a mass of undifferentiated jungle, was laced with paths and dotted with structures. We stopped by a one-room building that Trivers erected in 1975, which now serves as a guest room, and a water tank he built a few years later. Trivers pointed out trees he had planted over the years. Pimento, almond, soursop, walnut, mango, wild cherry, June plum, aki, cotton, dwarf coconut. He was especially proud of a line of graceful willows planted to shield his home from hurricanes. During Hurricane Ivan in 2004, his was one of the few local homes that kept its roof.

In 1994 he bought what was supposed to be a half-acre from a neighbor for $5,000. Friends told him he might have been cheated, so Trivers carefully paced off the land. It wasn’t half an acre, it was three quarters. He gave his neighbor an extra $1,000. “His face was beaming,” Trivers recalled. “That don't happen in Jamaica, brother, I can tell you that.” Trivers beamed too as he remembered his good deed.

Toward the end of the tour, his pride yielded to melancholy. “It’s a fantastic piece of land, but so what? In the end, you know?” He doesn’t think his children will want to keep the land after he’s gone. It requires too much tending. They certainly don’t want to live in Jamaica. Pushing through the tall grass ahead of me he muttered, “It’s getting me depressed talking to you. Seriously.”

Back in the house, Trivers said when he retreated to Jamaica in 2016 he started having a recurrent dream. He is wandering around a strange city, lost. He can’t remember how to get back to his hotel, or even the hotel’s name. In some dreams, he calls 911 to ask for help, and he can’t remember

his name. “So you know where I’m going, I’m going off to a mental hospital.” The dream “went on night after night after night for six fucking months.” Trivers thought it was a reaction to the final severance of his ties with Rutgers. Since then, for the first time in his life, he has had no base in the U.S. No home. Jamaica is a tropical paradise for birds and lizards, not for him. He will always be an outsider here.

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It was late morning, hot and humid. I was beginning to feel like a dick, a sadist poking a wounded old wolf with a stick. I told Trivers I had all the material I needed. Emily and I would like to leave now, and not at two o’clock, as we had originally planned. Could Trivers call the driver and ask him to take us to Negril? The heat is oppressing Emily, I said. She didn’t sleep well last night, and she wants to go to our hotel, which has air conditioning. Trivers looked at me sharply, and I remembered that earlier I had told falsely assured him that we slept well.

Trivers called the driver and left a message saying his guests wanted to leave as soon as possible. I asked about our options if the driver didn’t respond. Could someone else could drive us? No, Trivers said, he couldn’t find someone trustworthy on such short notice.

Emily, who had been reading in our bedroom, entered the living room. She gave Trivers a present, a ceramic pipe decorated with leaves of Datura, a hallucinogenic plant native to Jamaica. “Thank you very much, God bless you, I will try it this evening,” Trivers said. He seemed distracted.

To lighten the mood, I said I had only a couple more “easy” questions, on free will and God. Trivers ignored me. Staring at his laptop he muttered, “He’s a hustler. He’s a cheap hustler, like Ariely.” Dan Ariely is a psychologist who, Trivers had told me earlier, lured him into giving a talk at MIT by telling him how much he admired his work and then, in public, “demolished” him. Was Trivers joking? Was he really upset with me?

Abruptly he left the room. A minute later Emily whispered, He has a gun. What do you mean? I asked. She had just seen Trivers walking past a doorway with a pistol in his hand. I was still processing this information

when Trivers re-entered the room. He had changed his clothing. He was dressed in a clean white shirt, tie and dark blazer. I didn't see a gun. As un-ironically as possible I asked, Why the fancy clothes, Bob?

He had an errand to run, Trivers said curtly. He would be back soon. He left the house. Emily and I were sitting on the front porch considering our options when Trivers returned. A neighbor had died, he explained, and he had gone to his house to offer condolences to the family. Also, he had finally heard back from the driver, who would be here soon.

We waited on the front porch for the driver to arrive. Trivers stood in front of me, sipping from a dark brown bottle of rum cream, jacket slightly askew. Now I saw the gun clipped to his belt. Bob, why the gun? I asked. Trivers replied that he always wore the gun when he left the house. No point having a licensed firearm on this island if you don't carry it with you. I nodded.

Trivers, armed, seemed to stand taller and straighter, but it might have been my imagination. To my surprise, he recalled my previous question about free will. He said Huey Newton, shortly after they met, asked if he believed in free will. "I said, 'Well, Huey, I don't know exactly what people mean by free will, but we certainly evolved the capacity to look at our behavior afterward and adjust it appropriately.' He embraces me and says, 'We don't disagree on nothin'.'"

Trivers was intrigued by experimental evidence that our brains reach decisions a second or more before our conscious minds do. "So to that degree conscious free will is an illusion, as far as we understand it." In the split second after your brain makes a decision, your conscious mind can "nix the damn behavior." Otherwise, our conscious control over our actions seems limited.

I replied that I was a hard-core believer in free will, even though I recognized that we have a limited ability to control our actions. Emily chimed in, saying that in some cases we are "limited by our chemistry."

Trivers looked at her, stone-faced. "Everything is chemistry," he drawled. "So when you say that, you're not saying much."

Coming to my lady's defense, I said differences in neurochemistry, and genes, must explain why some people are so susceptible to alcoholism, drug addiction and depression. Fearing these examples might offend Trivers, I added that I had been severely depressed once, and it felt more chemical

than psychological, I couldn't reason my way out of it.

Friends can act as the voice of reason, Trivers responded, for example, by talking you out of retaliating against someone who has hurt your feelings. Your friend "did not suffer what you suffered, he does not give a flying shit about your pain. You know what I mean? So he can make a decision independent of fact that you just suffered a little bit of pain, and say, 'Forget about your fucking pain! It's in the past!'"

But your friend does give a shit about your pain, I said, he wants to spare you future pain, that's why he's telling you not to retaliate. Yes, Trivers said irritably, that was his point.

During this exchange, the driver pulled into the yard. Trivers watched Emily and me load our bags into the car. I shook his hand, Emily hugged him. "I'm sorry to see you go," he said, and to my dismay he seemed to mean it. As the driver eased down the driveway, I turned in time to get a final glimpse of Trivers staring glumly at the jungle.

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I spent the next week lolling with Emily on a sweltering white beach and in a frigid hotel room, worrying about how to describe our stay in He-Town. My job is to tell a story that is accurate, informative, fair, entertaining. "Fair" worries me most. Can I serve readers' interests, and thereby mine, without betraying Trivers?

Trivers was a warm, gracious host. Before we arrived he bought fish for us and had sheets and towels laundered. He took us on a tour of his land and his town, which had a tourist attraction called Lovers Leap. He entertained us with scientific fun facts and tales from his life on the island and elsewhere. He answered my questions, even those that upset him. He bared his heart.

I still have doubts about Darwinian science. Theorists ascribe much of what we do to instinct, but it is often hard to know where instinct ends and reason begins. We can be calculating in choosing and achieving our goals, even the goal of reproduction. And we acquire many of our values and inclinations from culture rather than biology. This is the point I tried to make

to Trivers and my science-writing class. Females' sexual choosiness, relative to males, could be a learned, rational behavior rather than an instinct. The same is surely true of many manifestations of altruism. We are brainwashed to be nice from an early age, and we learn that niceness, and even pseudo-niceness, is rewarded.

Trivers has also clearly projected his belligerent psyche, the "tough guy stuff," onto all of humanity. Whether because of nature or nurture, he sees even the most intimate relationships—between husbands and wives, parents and children, friends—as struggles. For this tempestuous man, at war with himself and with the world, life is a battleground, a contest for respect, status, reproductive opportunities.

But the more I contemplate the work of Trivers, the more profound it seems. It helps me understand why my reason and emotions, and selfishness and kindness, are so entangled. It gives me a little insight into the swirling, contradictory feelings I have when I interact with others, whether my girlfriend, children, friends, colleagues, students--or subjects of my journalism.

So my tale of He-Town is not meant to belittle Trivers and his ideas. Quite the contrary. It is meant, if anything, to pay homage to his view of human nature. Our meeting was, on its face, a straight-forward, tit-for-tat arrangement. I wanted material for my book. He wanted, I assume, a sympathetic portrayal that would burnish his reputation.

But once we met in He-Town, with a female looking on, cross-currents of emotion buffeted us. Between the two of us we felt sympathy, affection, delight, amusement, trepidation, mistrust, guilt, shame, loneliness, anger, melancholy. The more I reflect on my interactions with Trivers at He-Town, the more I realize they were just a high-pressure version of all my social interactions.

Trivers is right, life is a battleground, a war of all against all, even when the combat isn't physical. Before we came to Jamaica, I told Emily I wanted to read something good, a juicy classic. I was thinking of trying Portrait of Lady. Had she read it? Was it any good? After expressing obligatory shock that I, a supposedly educated man, had never read Henry James's greatest novel, Emily said, Yes, read it, it's fantastic.

Reading Portrait in Jamaica I was amused, at first, by the vast chasm between He-Town, where Trivers dwells, and the hyper-civilized realm

inhabited by Isabel, James's heroine, in which repressed ladies and gentlemen drift through European mansions and museums swapping witticisms. Call it She-Town. He-Town and She-Town seemed like planets inhabited by different species.

By the time I finished the book I realized how wrong my first impression was. Although Portrait lacks overt sexuality or physical violence, its ladies and gentlemen, including noble, brilliant Isabel, are whipsawed by desire, and they cruelly deceive and hurt each other. She-Town ain't so civilized either. The novel also exposes, with terrible irony, the limits of free will. Isabel's yearning for freedom ends up entrapping her in a miserable destiny.

Trivers has explained, as well as anyone, why it is so hard for us to be happy, to be good, to be honest. We are at war with ourselves as well as others, and our self-deception makes peace elusive. Our shared evolutionary heritage landed us in this tragic condition, which no one, no matter how privileged, intelligent and decent, can escape. But Trivers, whom I once implied was a cynic, isn't. He doesn't succumb to fatalism, despair or cheap irony. He believes passionately in truth, justice, honesty, loyalty, courage.

Darwinian theories of human behavior, historically, have been associated with right-wing, authoritarian ideologies, notably Nazism. Trivers, the greatest modern Darwinian, is an anti-authoritarian firebrand, a social-justice warrior. If he knows he is right and you are wrong, he'll come after you, no matter how big and tough you are. He loathes bullies in any form, whether a loudmouth hitting on women in a bar, a white cop harassing young black men or a superpower bombing third-world countries into submission.

Trivers values honor, that most old-fashioned and masculine of virtues, above all, and that is his tragic flaw. He is so exquisitely sensitive to slights, injustices, betrayals that he lashes out even at admirers and allies. Trivers expressed regret over his "absence of reflection" in his memoir and during my visit. "If you add up all the mistakes I've made in my life," he said, "four of my lives have been lost already." He wishes he had been less impulsive and more calculating in how he lived his life.

Here is the paradox of Trivers. His immense intelligence has given him deep insights into the limits of intelligence, into why it is so hard for us to reason our way to happiness and moral decency. He keeps crashing against those limits, because he is a man of such strong passion. And what's wrong

with that? At the beginning of his memoir, Trivers says he was never content with merely studying life. He wanted to live it, and he has, with hot-blooded intensity. His mistakes no doubt cost him opportunities, especially for further scientific achievement, but he still accomplished more than the vast majority of scientists. And his life has been a wild ride, filled with near-death adventures, romance and derring-do. What more can a man want?

Not to lay too great a metaphorical burden on him, but Trivers embodies the contradictions of modern humanity. So enlightened, so benighted! No matter how much we learn about ourselves, we will always be missing something, on which our lives might depend. Given what Trivers has shown us about the depths of our folly, our deadly capacity for self-deception, can we create a truly just, free world? Can we save ourselves? Will my students and children be okay?

I'll wrap up with a couple of anecdotes in which Trivers revealed his paternal side. Once, while he was driving his four-year-old daughter, Alelia, home from school, she asked, Daddy, what is the last number? There is no last number, Trivers explained, because whatever number she thinks of, he can just add a one to it. "And then she said, 'Like the sky?' And it nearly blew me out of my seat." Trivers's grizzled face glowed as he recalled the incident. His little girl had intuited infinity.

He mentioned his offspring again while standing with Emily and me on the brink of Lovers Leap, a cliff that rises 1,700 feet above the sea. According to lore, the lovers were young slaves. The plantation owner, who wanted the beautiful slave girl for himself, planned to sell the boy, and in despair they hurled themselves off the cliff. After telling us this tale of love and injustice, Trivers pointed out Great Bay, where he used to swim with his kids when they were small. He would stand in the deeper water beyond them, looking shoreward, so he could rescue them if a current caught them. A question popped into my head. Who rescues the rescuer?

Chapter Nine

# The Economist: A Pretty Good Utopia

The mind-body problem lurks at the heart of every life. You face it when you swill a glass of vodka moments after vowing never to drink again, when you squelch the urge to watch gay porn on the Internet, when you yearn to quit your soul-crushing Wall Street job and abandon your thankless family and write novels in a cabin in the woods, when you scream at that vicious voice in your head to shut up, when you see a shrink, swallow an antidepressant or pray to quell your despair, when you fear death but don't see the point of life, when you're lost, with no idea who you really are.

Each identity crisis is a microcosm of humanity's identity crisis. For millennia, we have dreamed of a world in which there are no more identity crises. We have discovered the Supreme Story, the final, true answer to the mind-body problem, the riddle of the human condition. We live together in harmony, with no more conflict, inner or outer, because we all know who we really are. We call this perfect world Paradise, Heaven, Shangri-La, Nirvana--or, if you prefer a less woo term, utopia.

Utopia, defined as a world in which we all share a common vision of who we are, is the most sublime idea ever invented--and the worst. We are never more dangerous than when we know, beyond all doubt, who we really are, and when we insist that others believe as we do. People gripped by this kind of certainty can become monsters who subjugate and slaughter others with self-righteous zeal. Faith in Supreme Stories has inspired crusades, inquisitions, slavery, genocide and countless wars, religious and secular. In the 20th century, utopian dreams of fascists and communists culminated in Auschwitz and the gulag.

In our era "utopian" has become, with good reason, a derogatory term, meaning naively idealistic. Does that mean we should abandon the concept? Not at all. If you dislike the world as it is, you should have a vision of it as you would like it to be. That is your utopia. Imagine your utopia, your ideal world, then imagine how we can get there. All progress begins with this sort of wishful thinking. Ideally, your vision will be reasonable, not

delusional. It will be based on what we have learned about ourselves from science and from history. Given our biology, and our past, is it reasonable to hope for a future without war? Poverty? Tyranny? Injustice? These, too, are mind-body questions.

Other experts in this book have dwelled on mind-body riddles like consciousness, the self, free will, mental illness, morality and the meaning of life. Economist Deirdre McCloskey, the heroine of this penultimate chapter, has focused on the knotty, practical question of how we should govern and sustain ourselves. What political and economic system gives us our best shot at communal happiness? McCloskey thinks she has found an answer. Or rather a story, one that works pretty well, that might help resolve our ancient, communal identity crisis.

Before I get to that big-picture story, I need to tell you McCloskey's personal story. As I hope will become apparent, the two stories are not unrelated. In her memoir Crossing, published in 1999, McCloskey reveals that she was born in 1942 a boy, whose parents named him Donald. McCloskey refers to both Donald and Deirdre in the third person, as though her authorial persona is yet another self, which of course it is. In one of her earliest memories, Donald was five and his mother took him to an ice cream shop in Harvard Square. McCloskey writes:

"After a hot fudge sundae and a watery Coke [Donald] had to go to the bathroom, so she took him into the ladies' room. It was nothing out of the ordinary. She wasn't going to leave her five-year-old son in a strange men's room when he needed to wee-wee, not even in the safe world of 1947. What's not ordinary was Donald's sharp memory of it, the ladies in the tiny room speaking kindly to the boy as they straightened their seams and reapplied their lipstick."

Donald grew up tall and barrel-chested, with broad shoulders. He was captain of his high school football team, for which he played lineman. He was intellectually ambitious, not surprisingly, since his mother was a poet and his father a professor of government at Harvard. Donald earned a bachelor's and doctorate in economics at Harvard, and in 1968 he landed a job at the University of Chicago, a bastion of free-market economics. In 1980 he moved to the University of Iowa, where he remained for 19 years and his crossing took place.

He made a name as a "tough-guy economist," a defender of free

markets and critic of his field's methods who wrote with literary flair. At 22 McCloskey married Joanne, a nurse who eventually became a professor of nursing. They had a son in 1969 and daughter in 1975. Professionally and personally, McCloskey seemed to have all a man could want, but he had a secret. He liked wearing female clothing. He donned his mother's panties when he was 11 and felt "a rush of sexual pleasure." In his teens he snuck into neighbors' homes and tried on crinolines, garter belts and other "equipment of a 1950s girl."

McCloskey kept crossdressing after his marriage. When he confessed his secret to his wife, she wasn't thrilled, but she accepted it, because she loved him, and he was a good husband, father and provider. He married Joanne and raised children with her because he truly loved her, not because he was trying to prove his masculinity. But he compensated for his sexual confusion by acting macho. He could be ruthless in seminars and at conferences.

In the early 1990s his crossdressing intensified. He dressed in drag not only in private but also, increasingly, in public. He visited gay bars and attended gatherings of crossdressers, some of whom had gone to drastic lengths to prove their masculinity. One volunteered during the Vietnam War to be a "tunnel rat," who carried out search and destroy missions in tunnels dug by the Vietcong.

Driving away from one of these meetings in 1995, McCloskey had an epiphany. "I am not a heterosexual crossdresser," he thought. "I am a transsexual… I am a woman." Many psychiatrists and other so-called experts insist that men who crossdress and fantasize about being women are homosexuals. They are wrong, according to McCloskey. Donald had rebuffed homosexual advances. "He wasn't gay," McCloskey writes. "He loved gals, not guys. He would rather have been gay than a gender crosser: it was less bother."

When he told those close to him he planned to change gender, some, especially his wife, reacted with shock. Others were surprisingly supportive. Crossing has a scene in which McCloskey tells his dean about his plan (and passages like this might explain why McCloskey has irked feminists):

Gary sat stunned for a moment. They were both economists, conservative by academic standards, free-market enthusiasts. Then:

"Thank god….I thought for a moment you were going to confess to

converting to socialism!”

[Donald] laughed, relieved. The dean was going to act like a friend.

“And this is great for our affirmative action program — one more woman, one less man.” More laughter. More relief.

“And wait a minute — it’s even better: as a woman, I can cut your salary to seventy cents on the dollar!”

Donald had his facial and body hair removed and underwent hormone injections and surgery on his face. McCloskey’s younger sister Laura, then teaching psychology at Harvard, had Donald forcibly committed to a mental hospital, twice, to prevent him from getting surgery. On one occasion, police detained Donald at an academic conference. Laura threatened to sue any surgeon who operated on her brother.

To her humiliation, McCloskey had to defend her sanity in court before she could get the surgery. The experience left her with a disdain for psychiatrists, some of whom testified against her. In psychiatry as in her own field, she realized, ignorance often postures as expertise. “Since we know so little about the economy, or about gender crossing, better laissez faire,” she asserts. Eventually she got the surgery, completing her transformation. She called her new self “Deirdre,” “wanderer” in Old Irish and the name of a legendary Irish heroine.

As I read McCloskey’s memoir, she struck me as a real-life version of the Greek mythological figure Tiresias, whom the Gods turned from a man into a woman. Like Tiresias, McCloskey has lived on both sides of the boundary between male and female, which for most of us is impermeable. The crucial difference is that McCloskey chose to cross that boundary. She didn’t submit passively to her biological destiny, the way most of us do.

I’ve never been more curious before an interview than before I met McCloskey. In 2000, she left the University of Iowa and took a job at the University of Illinois at Chicago. Although she retired in 2015, she still lives in Chicago in a two-story loft with high ceilings, bare brick walls and huge windows overlooking her neighborhood. And it is a neighborhood. Her lawyer and dentist live down the block. Across the street is her church, where she attends services every Sunday morning.

When I visited her in the summer of 2016, she greeted me wearing a silky salmon shirt, jeans and drop earrings. Her hair was blond, the nails of her jeweled fingers red. She is six feet tall, with broader shoulders than hips.

Although her surgically sculpted chin and nose are delicate, her face remains strong-featured. She sat, stood and walked stiffly, aftereffects of old athletic injuries.

During her transition, McCloskey had an operation on her vocal chords to feminize her voice. The procedure didn't work. She sounded hoarse, as if her throat were sore. A stutter that has afflicted her since childhood seized her now and then. Snagging on a P or S, her mouth clenched, her eyes lost their focus, as she strained to get the damn word out. But McCloskey barreled past her speech impediments, as she does most obstacles.

McCloskey invited me to spend the night in a guest bedroom rather than a hotel. I arrived late on a Saturday morning and departed late the next morning. Except for bathroom breaks, dog walks and sleep, we talked nonstop, through two meals at local restaurants. The conversation ebbed and flowed but never ceased.

I had expected our encounter to be awkward, because, well, just because. But I felt at ease with McCloskey, or as at ease as I feel with anyone. Hours into the interview, I asked if she needed a break, and she shook her head. "Here it is, 20 years after my gender change, and I still like to talk about it. You would think you'd get bored, but hey, it's about moi. How can I get bored? We are all not quite at Donald Trump level, but there is a Narcissus--or Narcissa--in all of us."

She gave me a tour of her living room, noting that "everything in this room is emotional." She identified objects of particular affection. A model of a 17th-century Dutch merchant ship, which reflects her admiration for Dutch industriousness. Busts of her heroes Athena, Dante and Socrates. A statue of Saint Francis of Assisi, a marionette of Frank Lloyd Wright. "When I was a kid, I liked marionettes," she explained. "I think they were a substitute for dolls."

She told me lots of things I didn't know. Marilyn Monroe was a stutterer. "That's why she talked in that funny way," McCloskey said, imitating Monroe's breathy baby voice. "If you talk in a funny way, you don't stutter." Many engineers are crossdressers. "It's almost that, if you know an engineer, he's likely to be crossdresser." (This assertion got me wondering about engineering professors at my school.) Some feminists are hostile toward transsexuals, accusing them of piggybacking on real women's

hard-earned progress.

Lesbians love throwing Super Bowl parties. The first time McCloskey attended such a party, she was fascinated by how it differed from male football gatherings. “They are lesbians, but they are women, so everyone brings a covered dish. No man would bring a covered dish. They would bring a couple of six packs.” Most of the women talked during the game. Only he and an especially butch lesbian watched it. McCloskey’s laugh, recalling this scene, was deep and throaty.

McCloskey introduced me to her tiny roommates, William Shakespeare, her dog, and Virginia Woolf, who belongs to her sister Laura. McCloskey was taking care of Virginia Woolf while Laura was traveling. When I expressed surprise that she is caring for her Laura’s dog, McCloskey replied, half joking, that she is grateful to her sister. Crossing, her memoir, “would have been very boring” without Laura’s interventions.

Did Laura ever apologize for her actions? McCloskey mused for a moment before replying, No, but that was okay, because she forgave Laura long ago, and they get along fine now. McCloskey has turned down proposals to turn Crossing into a play or film, because she worried Laura would be “the heavy.” She wants Laura to move to Chicago, so they can serve as each other’s companions, eating out and going to plays, opera, movies together. “We joke. Am I her older sister or her younger sister? I’m 11 years older chronologically, but as her sister I’m younger than she is.”

Other family bonds dissolved. Throughout her crossing, McCloskey never stopped loving her wife and wanted to remain married. Joanne, who “was grievously injured” by the crossing, insisted on a divorce and has shunned McCloskey ever since. McCloskey understands her ex-wife’s rejection. She has a harder time accepting that of her son and daughter, who were young adults when she crossed. She has grandchildren she has never met. But if her children walked in the door at this moment, “I would hug them and pretend” they had never been estranged.

Like Alison Gopnik, who discovered her bisexuality during her mid-life crisis, McCloskey emphasized the fluidity of sexuality. Studies of heterosexual crossdressers, she said, indicate that after hormone therapy and surgery “a third go on loving women, a third come to love men and a third are asexual.” Only after she got hormone therapy did McCloskey start finding men sexually attractive. Slipping into economic jargon, she joked that she

saw men as “consumption items rather than as competitive suppliers.”

After she began taking hormones, she watched Pride of the Yankees, in which Gary Cooper stars as Lou Gehrig. When Cooper/Gehrig, dying of a neurodegenerative disease, tells fans in Yankee Stadium that he is the happiest man alive, McCloskey wept. “I never cried at movies as a guy, no matter how sad they were,” she said. She stopped taking hormones long ago, but sad films still make her weep. (I told McCloskey that films, television and even sentimental ads make me weep, but real life rarely if ever.)

Deirdre differs from Donald in other ways. She likes cooking more and sports less. She has gotten worse at telling jokes, which requires “a little-boy assertiveness that she finds less attractive now,” as she put it in Crossing. She takes the side of women embroiled in disputes with men. She is neater, less single-minded and impatient. She dotes on children. She drives less aggressively.

Could aging have caused some of these changes? Of course! McCloskey replied. When she gives talks, she likes to say that she feels wiser since her crossing, but she’s not sure if it’s because she’s older or because she’s female. She chuckled. Women usually laugh at this line, while men “look kind of annoyed.”

Feminists have accused her of propagating stereotypes. “They say, ‘Oh, you’re dealing in clichés about men and women.’” She just tries to report what she sees and feels as honestly as she can. Her observations of herself and others have convinced her that females care more about relationships, romantic and non-romantic. “When I was a guy I was about average for men in my interest in relationships. Now I am above average for men but below average for women.” She laughed. “So still the drag of my XY genes is there.”

McCloskey has not had a sexual relationship since her crossing. After her divorce, she went on a few dates with men, but none worked out, and eventually she abandoned her search for romance. “I would like to have someone cherish me, but I don’t feel it strongly enough.” Her genital surgery also left her with complications, which have required follow-up treatment. She no longer feels arousal, either psychological or physiological, she said, pointing to her head and crotch. “My sexual drive is zilch,” she said. “I have no deep problem with that, because, as you know, sexual desire is kind of a pain in the neck.” Also, she was married to the love of her life for 30 years.

“I’ve had that, been there, done that.”

McCloskey’s crossing wasn’t easy. It was an emotional, physical, legal, medical and financial ordeal. She estimates that she spent almost $100,000 on medical and legal bills. But she has no regrets about crossing. None. “I have been a woman for over 20 years. And since the day in August of 1995 that it hit me, that I could do it and I was gonna do it--I called it an epiphany--from that moment, I have not had a moment of doubt.” Most transgender people, she said, are happier after they change. “I am a very happy person.”

Before crossing, Donald often felt shame about his sexual confusion and feared it would be discovered. Echoing Elyn Saks’s attitude toward schizophrenia, McCloskey said that if someone had offered Donald a pill that deleted his compulsion to crossdress, he would have taken it. But then Donald became Deirdre and revealed her true self to the world. “I got no secrets,” McCloskey said, grinning. “I’ll tell you anything.”

She expressed ambivalence about crossing only once, when envisioning her obituary. She hopes it doesn’t dwell too much on her gender change. She wants the final reckoning of who she was and why she mattered to highlight her scholarly accomplishments, and especially her ideas about the “Great Enrichment” (which I’ll get to soon). She’d love to win a Nobel Prize in economics before she dies. That would surely push the crossing down a sentence or two.

Listening to her, I felt awkward, because her crossing, more than her economic views, had brought me here to Chicago. I wanted to know, What would it feel like to be a woman who was once a man? But here’s the irony. After a few hours with McCloskey, I was so immersed in her enthusiasms and aversions, her jokes and anecdotes and insights, her upbeat view of humanity’s past and future, that her crossing seemed, not unimportant, exactly, but just one more aspect of her capacious, irreducible self. I didn’t think of her as female, male, transgender. I thought of her as a person, as stubbornly herself as anyone I’ve ever met.

McCloskey revels in her multiple selves. “I’m a daughter, I’m a sister, I’m a friend, a church lady, a professor, teacher, writer,” she said. She likes to call herself “a literary, quantitative, postmodern, free-market, progressive-Episcopalian, Midwestern woman from Boston who was once a man.” Her gender isn’t fixed. “Sometimes I dream I am still a man and protecting my

wife," she told me. "Sometimes I dream as Deirdre. It doesn't seem to matter. I drift between one and the other."

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McCloskey, who has written 18 books and hundreds of papers, kept working throughout her crossing. Asked how becoming a woman influenced her scholarly outlook, she once replied, "The virtue of Love, it seems to me, belongs in any serious science of economics." Given this remark, you might guess she drifted left. But far from renouncing her free-market faith, she reaffirmed it in The Bourgeois Virtues (2006), Bourgeois Dignity (2010) and Bourgeois Equality (2016). Collectively called The Bourgeois Era, the trilogy is an epic, 2,000-page love poem, dense with facts and statistics, dedicated to that class of peddlers, inventers, investors, manufacturers, managers, traders and hustlers called, usually disparagingly, the bourgeoisie.

Our species, McCloskey notes, has undergone countless crossings since its emergence in Africa a few hundred thousand years ago. One of the biggest was our transformation from nomadic hunter-gatherers to farmers, who settled down and accumulated surplus goods. Civilization soon followed, and yet for most of history the vast majority of humans lived a hand to mouth existence.

Only toward the end of the 18th century did humanity rise from its crushing poverty, first in Western Europe and then across the globe. Between 1800 and 2000 average incomes around the world, including the poorest as well as richest nations, grew by a factor of ten. In affluent western nations, average incomes multiplied 30-fold. This is the Great Enrichment, which McCloskey calls "the most important secular event since the invention of agriculture."

Economists have attributed the Great Enrichment to various factors: The discoveries of Galileo, Newton and other scientific revolutionaries and the institutionalization of science. Steam engines, railroads, mass-manufacturing and other inventions that drove the Industrial Revolution. The rise of aggressive nationalism, along with wars of conquest, imperialism, colonialism.

McCloskey traces the Great Enrichment to the cluster of ideas, sometimes called liberalism, enshrined in the American Declaration of Independence and other Enlightenment manifestos. We are all equally deserving of respect and dignity. We all have the right to pursue our happiness, material as well as spiritual, as we see fit. We all matter, as Rebecca Goldstein would put it. If you give people freedom, McCloskey assured me, “you encourage them, you honor them, and pretty soon you get the Great Enrichment.”

McCloskey sees capitalism as the economic manifestation of our freedom. Actually, she doesn’t like the term capitalism, because it focuses on wealth rather than the activities that produce it. She prefers “technological and institutional betterment at a frenetic pace, tested by unforced exchange among all the parties involved.” Or, if you find that too wordy, “trade-tested betterment.”

Another crucial cultural shift was growing respect for pursuit of wealth. Well into the Industrial Revolution, many artists and intellectuals--McCloskey calls them “the clerisy”--disparaged the bourgeoisie as soulless, money-grubbing materialists. Actually, McCloskey asserts, trade-tested betterment has enriched us culturally, morally and spiritually as well as materially. Self-cultivation is hard if you’re an illiterate peasant struggling to survive.

Some prominent economists contend that war catalyzed the Great Enrichment by promoting innovation and economic growth. McCloskey hates this “fascist” idea. “Killing people and burning down their houses is usually not very good for them,” she said archly. If World War I could have been averted, “we would have had a very different 20th century.” We would have averted totalitarian communism, fascism and World War II, and the Great Enrichment would have been greater. Far from fueling the Great Enrichment, war imperils it.

She acknowledges that the Great Enrichment has always been terribly incomplete, benefitting some races and places far more than others. But if we can avoid major wars, McCloskey said, the Great Enrichment will expand. Automation will continue to drive down the cost of goods, just as it has driven down the costs of food production. Since 1800, the productivity of the average agricultural worker has increased 300-fold.

During a recent stay in Sweden, McCloskey visited a Volvo factory.

“It was wonderful to behold, all these machines welding, and some guy standing around in a white coat looking at dials. That’s how they make cars these days!” Just as farmers displaced by modern technology have found other means of unemployment, so will modern workers replaced by robots and computers. We will adapt to climate change, too, not by scaling back our consumption but by inventing more energy-efficient technologies and methods for removing carbon from the atmosphere. “Let’s not close down industrial civilization and go back to Walden Pond.”

Democracy and free-market capitalism are imperfect, McCloskey acknowledged, but they are vastly preferable to communist, fascist or theocratic systems. She likes political scientist John Mueller’s comparison of capitalism and democracy to a store in Lake Wobegone, the fictional town of the radio show “Prairie Home Companion.” The store is called “Ralph’s Pretty Good Grocery,” and its slogan is, “If you can’t get it here, you can probably get along without it.” Our system of capitalism plus democracy is “pretty good,” McCloskey said. “By historical standards what we have is incredibly good.”

Just to be clear: McCloskey is saying that we have already answered the collective version of the mind-body problem, which asks what we are, can be and should be. The answer is that we should be bourgeois. And just to be really clear: I agree with her. So, I’m pretty sure, do all the other subjects of this book. Some of my lefty friends no doubt will react to this chapter by saying: You end your big inquiry into what humanity should be by saying we should be… bourgeois? That’s the payoff? They will point out that my subjects and I are all white, American academics. Of course we love bourgeois culture! We’re its beneficiaries!

But the answer to humanity’s identity crisis isn’t bourgeois culture per se, it is the commitment to freedom that produced it, which has benefitted people worldwide. Our pretty good liberal utopia is the inverse of the monomaniacal ones that have gotten us into so much trouble in the past. Liberalism is a meta-mind-body story, even an anti-story. It rejects the ancient dream of a Supreme Story, a single, final, absolutely true answer to the question of who we are.

Far from eliminating identity crises, liberalism enables them, even encourages them, by giving us lots of options. It does not tell us who we are. It gives us the freedom and means to figure that out for ourselves. “It’s

strange to have been a man and now to be a woman," McCloskey writes. "But it's no stranger perhaps than having once been a West African and now being an American, or once a priest and now a businessman. Free people keep deciding to make strange crossings, from storekeeper to monk or from civilian to soldier or from man to woman."

Do systems superior to democracy-plus-capitalism lurk out there in the multi-dimensional space of possible systems? If humanity went through an annealing process—triggered by a nuclear war, warming-induced surge in sea levels, viral pandemic, or pandemics of fascism or militant fundamentalism--might we crystalize into a better system for promoting self-exploration? Perhaps, but I hope never to see that conjecture tested. After violent disruptions, large societies often collapse into an inferior state, at least for the short-term. Look at the bloodbaths that followed the French Revolution and communist seizures of Russia and China.

McCloskey chided left-leaning intellectuals, the modern clerisy, for wallowing in pessimism about "growth or consumerism or the environment or inequality." She envisioned a world in which everyone is bourgeois. Over the next century, developing nations in Africa, South America and elsewhere will catch up to the first world. "They are all going to get as rich as us, and we are going to get a massive number of people searching night and day for trade-tested betterments," she said. "It's going to be wonderful."

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Listening to McCloskey extoll the bourgeoisie, I kept thinking of my father. He grew up poor during the Depression, but he got a free education from the U.S. Naval Academy. After serving on a destroyer in World War II, he worked his ass off to create a good life for me and my four siblings, and I reviled him for it. I showed my contempt for his bourgeois values by decorating my bedroom with communist iconography, brawny, rock-jawed workers gripping hammers and sickles and gazing bravely into the utopian future. Around that time, Soviets troops were crushing democratic uprisings in Czechoslovakia and elsewhere.

America's glorification of material wealth galled me, and so did the

Cold War, the nuclear arms race and the Vietnam War. Our leaders mouthed platitudes about peace and freedom while bombing Southeast Asia and tolerating racism at home. I fantasized about an apocalyptic war, from the ashes of which would arise an anarchist hippy paradise. To my parents' dismay, after graduating from high school I refused to go to college, which I disdained as a factory for turning out bourgeois dicks. I spent years wandering around the country working odd jobs, trying to figure out who I was.

I didn't finish college and graduate school and get my first job as a science writer until I was 30. I'm bourgeois now, a journalist and college professor with a Prius, flat-screen TV and retirement fund. My father and I made up decades ago. I admire him as much as anyone I know, and not just because he helped pay for my education. He is a good, big-hearted man, altruistic toward kin and non-kin alike.

So long before I fell under McCloskey's spell, my aversion to bourgeois values had subsided. Marx, of all people, helped me appreciate the charm of the bourgeoisie. A decade ago, I started teaching a freshman humanities course, a required text of which is the Communist Manifesto. Marx and Engels complained that the bourgeoisie tramples all values in its quest for profits. Everything, including humans, becomes a commodity. Capitalism leads to "naked, shameless, direct, brutal exploitation."

But like McCloskey, Marx and Engels acknowledged capitalism's creative power, cultural as well as material. Capitalism has undermined the authority of religion, nations, aristocracy, even families. It has liberated us from "ancient and venerable prejudices and opinions." It has attracted people to cities and hence "rescued a considerable part of the population from the idiocy of rural life." It has fostered "a world literature" and countered "narrow-mindedness."

Marx and Engels even foresaw how capitalism would liberate women. "The less the skill and exertion of strength implied in manual labor… the more is the labor of men superseded by that of women." The decline of aristocracies, religion, nationalism, "venerable prejudices" and "idiocy"? The rise of literacy and gender equality? Sounds pretty good!

And how has Marx and Engel's alternative to capitalism worked out? Some scholars estimate that communist regimes were responsible for the deaths of more than 100 million people in the 20th century. China, the major

remaining communist state, which still curtails freedom of speech and other basic rights, has become an economic powerhouse by allowing its citizen to practice a restricted form of “trade-tested betterment.”

Marx’s messianic language was the source of his persuasive power, but it was also his tragic flaw. He spoke, no, he preached with the fervor of a prophet who knows who we really are and should be. He has discovered the true, final answer to the collective version of the mind-body problem. His vision inspired devotees into taking action--and turned many into murderous zealots.

Ideologies like Christianity, Islam, Social Darwinism, eugenics and free-market economics have also inspired lethal zealotry. The lesson is clear. When we talk about our hopes for humanity, what we can be and should be, we should be humble. We should heed the advice of Owen Flanagan: Doubt yourself. We should think like engineers. Instead of seeking the final, absolutely true solution to our problems, we should just look for something that works.

McCloskey is humble, in her ebullient way. In her 1985 book The Rhetoric of Economics, she urges economists to acknowledge the subjectivity of their judgments, and their reliance on rhetoric. Economics will thereby become “more modest, tolerant and self-aware” and hence more honest and effective. Writing about the Great Enrichment, McCloskey cites plenty of empirical evidence, but she never pretends to be wholly objective. Her affection for the bourgeoisie is clearly a matter of taste as well as truth.

I still lean sharply left. I loathe my country’s moronic militarism, its persistent racism and sexism, its veneration of the super-rich and callousness toward the poor. Capitalism still leads to the “naked, shameless, direct, brutal exploitation” that Marx and Engels deplored. In 2016 I brought the socialist firebrand Naomi Klein to my school. She argued, persuasively, that unrestrained capitalism spawned global warming, which has brought us to the brink of disaster. If we don’t curtail our mindless pursuit of economic growth and consumption of fossil fuels, civilization might collapse.

But neither Klein nor any other left-leaning intellectual I know wants to abolish capitalism. They advocate reform, and so does McCloskey. At one point during our conversation, I confessed that in my youth I fantasized about a cataclysm that would sweep everything away, so we could start fresh. “I can remember the feeling of wanting a revolution,” McCloskey said,

nodding. She sang, in her hoarse, scratchy voice, an old anarchist song:

Anarchists in garrets, narrow and thin,
smell the smoke of nitroglycerin.
It's sister Jenny's turn to throw the bomb.
The last one was thrown by Brother Tom.
Mama's aim is bad,
and the Cop-skis all know Dad.
So it's sister Jenny's turn to throw the bomb.

We must give up these nihilistic "enthusiasms," McCloskey said, without giving up our hopes for a better world. Some day, we might even create a pluralistic utopia like the one Marx envisioned. Communism, Marx wrote, would free us from bondage to a single job or identity. You can "hunt in the morning, fish in the afternoon, rear cattle in the evening, criticize after dinner… without ever becoming hunter, fisherman, herdsman or critic."

At the beginning of this book, I said I'd propose how we can create a more peaceful world, in which we all have a pretty good shot at happiness. My proposal is simple. Everyone, including those who put their faith in science, would accept once and for all that there is no Supreme Story, no single, objectively true answer to the mind-body problem, which tells us who we are. We would recognize that our belief in Supreme Stories has been harmful, the cause of tremendous suffering. At the very least, I'd love to see people reject mind-body stories that flagrantly contradict science and curtail our collective freedom. Like: God created humans 6,000 years ago and gave my race, and my gender, dominion over yours.

But in a pretty good liberal utopia you can, if you like, believe in a Supreme Story. You can be a Christian, Sufi, Orthodox Jew, Buddhist monk or Amish farmer. You can be a Luddite, survivalist, communist, transhumanist or libertarian. You can even be a fascist, racist, sexist dick. You are free to create your own community of like-minded souls--as long as you remain peaceful and don't force your beliefs on others. You are free to give up your freedom, but not to take freedom from others. My pretty good utopia is better than yours if mine allows yours and not vice versa.

We still face lots of tough questions. How do we protect ourselves from violent apocalyptic cults, or corporations that subvert democracy to boost their power? How can we raise the standard of living for all people without despoiling nature beyond repair? Should we fear or welcome

technologies that can enhance our cognitive powers, maybe beyond recognition? Should those technologies be available for everyone or just those who can afford them? How do we ensure that everyone has a shot at becoming who she wants to be, as McCloskey did? Solving these problems will be hard, and we will no doubt make mistakes, but I'm confident we will keep creeping, lurching, stumbling in the right direction.

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On Sunday morning I woke up in McCloskey's guest bedroom filled with irrational exuberance. I overflowed with affection for humanity, for the bourgeoisie, for my father, for McCloskey. What a wonderful subject! I jotted down impressions in a notebook. "She has no secrets, nothing to fear," I wrote.

Cowardice compels most of us to accept the destinies thrust upon us by biology and upbringing, nature and nurture, but not McCloskey. Soldiers dodging bullets and bombs are doing what their culture demands. Their courage pales beside what it took for McCloskey to attend a crossdressers' convention in the Poconos, to submit to genital surgery, to walk up to a podium at an economics conference and give a talk for the first time in a dress. Listening to her, I kept thinking, What would it feel like to be that brave?

Before I met McCloskey, I wasn't sure how I would end this book, or if the ending would be happy. McCloskey and her crossing gave me my happy ending. Brave souls like her make it easier for the rest of us to explore ourselves. They expand our freedom, our choices. Her crossing was hard, but the fact that she succeeded is yet more evidence of our moral and material progress.

Later Sunday morning, after McCloskey walked Shakespeare and Virginia Woolf, we sipped coffee on her big red couch and resumed our conversation. McCloskey, who was dressed for church, seemed subdued. When I told her how much I admired her courage, she smiled and shook her head. She isn't that brave, she assured me. She hates talking over the telephone, because her stutter sometimes grips her. During every writing

project, large or small, she passes through a “dark night of the soul” when she fears she has lost her power of expression. She worries about death and decrepitude. “I fear there is a stroke in my future,” she said.

Temperamentally, and as a matter of principle, she tends to be upbeat. “If you're not optimistic and don’t have a sense of humor,” she said, “don't change gender, because it’s not going to be all fun.” She abhors literature, like T.S. Eliot’s “The Hollow Men,” that rubs our noses in life’s ugliness and meaninglessness. She loves artists like Matisse and Chagall, who see the beauty in spite of everything. “Chagall was an eastern European Jew. His family died in Holocaust. He had every reason to be pessimistic.”

But you can be too optimistic, McCloskey said. She worries about humanity’s future, because she is a realist. She does not believe humanity is “basically good,” and that “everything is going to turn out okay.” She disagreed with Socrates that deep intellectual inquiry makes you wiser and more virtuous. “I’ve known ignorant people who were saints,” she said. “I have known learned people who were devils.” Enlightenment intellectuals like Kant and Jefferson, who preached equality, viewed non-whites and females as biologically inferior.

One third of the officers in the German SS had advanced degrees in humanities. The film Schindler’s List dramatizes this irony. In one scene, McCloskey noted, a German officer supervising the arrest of a Jewish family plays “some marvelous piece of Mozart” on its piano.

McCloskey, who was baptized at an Episcopalian church in Iowa City shortly after her crossing, views humanity as sinful. She compares her faith in God to her faith in democracy. She doesn’t necessarily believe “it’s all going to work out.” God gave us free will because He doesn’t want us to be “puppets,” McCloskey said. “Free will would be meaningless if there were no opportunity costs.” (Note her insertion of an economic term, “opportunity costs,” into a theological remark.) So we live in a world with disease, aging, earthquakes, tsunamis and infinite varieties of human cruelty.

It was late morning, time for me to head home and for McCloskey to attend mass. We walked out of her apartment together and stopped on the sidewalk outside her building. She advised me to walk to the end of her block to catch a cab to O’Hare. We shook hands. Then she pecked me on the cheek, said “Goodbye, dear,” and crossed the street toward her church.

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What many of us want from a mind-body story, above all, is assurance that everything is going to be okay. McCloskey, for all her optimism, shores up her faith in the bourgeoisie with faith in God. Other subjects of this book also have doubts about humanity's future. Alison Gopnik pointed out that many Americans do not accept basic liberal values, such as tolerance for homosexuality. Rebecca Goldstein was distraught over the resurgence of racism, sexism and "competitive mattering," the idea that some people matter more than others.

Christof Koch, in spite of his cheerful temperament, might have the gloomiest view of the future. He worried about nuclear terrorism, environmental catastrophes and disruptions triggered by artificial intelligence. Machines might eventually outsmart us and take all our jobs, he said. "It's something to worry about." A year after I spoke to him in Seattle, he proposed in The Wall Street Journal that humans can and should boost their cognitive capacities with brain implants to keep up with super-intelligent machines.

Rebecca Goldstein said intellectuals have a responsibility to be realistic, not optimistic. But at any given moment, the world offers infinite reasons for feeling good or bad about the future. It comes down to a choice: optimism or pessimism? As a young man, I was profoundly pessimistic. After the Cold War ended and I became a father, I swerved toward optimism.

I like to think my optimism is rational, based on truth more than taste. The first step toward creating a better world, I tell myself, is believing it is possible. But to be honest, my optimism is based on faith, a gut feeling. Robert Trivers and Douglas Hofstadter, who look unflinchingly at the brutality of nature, especially human nature, would no doubt find my optimism sentimental, and perhaps they are right. I might be suffering from gladsadness, delusional happiness. Sometimes I feel like a silly old fool for thinking that things are going to be okay.

On January 21, 2017, I took an early morning train from Newark to Washington, D.C. There I met Robert, an old pal I hadn't seen in years. Nostalgia as well as outrage brought us together. Robert and I went to

Washington to protest Bush's inauguration in 2001, and we wanted to relive that adventure. At one point we got swept up in a mob in black boots, pants, hoodies and facemasks racing through the streets. They smashed windows of shops and cars, obstructed traffic, knocked over garbage cans, detonated M80s (or some other powerful firecracker) and fought with helmeted, club-wielding, mace-spraying police. Robert and I managed to escape the melee un-harmed. Later we found ourselves marching beside young anarchists waving a red and black flag and shouting, "Fuck the bourgeoisie!" I wanted to tell them, Hey, come on, that's me you're talking about.

I was glad to get back to my students in Hoboken. When I told them about my trip, they seemed amused, especially by the anarchists chanting, "Fuck the bourgeoisie." My students want to join the bourgeoisie, not overthrow it. They want to be engineers, computer scientists, physicians, financial analysts, inventors, entrepreneurs. But they worry about whether things are going to be okay. They fret over melting ice caps, viral epidemics, nuclear terrorism, robots taking their jobs.

To boost their spirits, I give them my utopia pep talk. A utopia must do more than make everyone happy, I tell them. You can easily imagine a society in which brain implants, drugs or genetic engineering make you feel good but your life is meaningless because you have no choices. Right? That's what Brave New World was about. Freedom is essential. The more freedom a society gives its citizens, the closer it is to utopia. Making freedom your core value comes with complications. Some people might find freedom overwhelming. They might think there is such as a thing as too many choices. A free society can choose to become less free. That's the paradox of freedom.

But most of us want freedom, the more the better, and the good news is we're getting it. When I was a kid, abortion was illegal in some states. So was inter-racial marriage and homosexuality. You could end up in prison for having consensual gay sex. Laws prohibiting abortion, miscegenation and homosexuality have been abolished. Now gay people can get married.

You can do things unimaginable a century ago, I tell my students, because of advances in science and technology. You can microwave frozen pizzas and take hot showers whenever you feel like it. You can fly across oceans and continents. With a few swipes of your smart phone, you can access virtually infinite knowledge. When you get out of this school, you can work to solve the problems that oldsters like me have dumped on you. You

can help design better solar panels, electric cars, gene therapies, desalinization plants.

Because I like bragging about cool people I know, I mention a big-shot economist I once interviewed who has a really upbeat view of the world. She thinks we have so many choices, compared to almost everybody who has ever lived, that we already live in a kind of utopia. And that's not the only interesting thing about her. When she was in her 50s, she had a sex-change operation. Her ability to do that symbolizes, to my mind, how far we've come, medically, legally, politically, morally.

So don't despair, I tell my students. Imagine the future you want, and create it, and your kids will have even more choices than you do. I mean, if you want kids, no pressure. I ask them to write down answers to this question: What's your utopia? Answer in any way you like, I say, serious or light-hearted. Here are answers from a freshmen class I taught in 2017.

Ryan: Some of the conflict that comes from an imperfect world makes it better. I wouldn't want scientists, philosophers and other intellectuals to have all the answers. They should have different views, because debates are often entertaining and make life more worth living. Competition can also give meaning to life. Utopia should have a certain amount of inequality to make things interesting, but not a staggering amount to where people suffer because of it. Utopia isn't a completely perfect world, but a world with the perfect amount of imperfection.

Jesse: My utopia is a world where the rat race no longer exists. Why is it that people find it normal to slave away all their lives for a minuscule reward in the end? Why is it that wanting to enjoy life and take breaks is frowned upon? We have followed the same pattern for centuries, but it is time for a change. Instead of one long and boring retirement at the end of our lives, why not enjoy mini-retirements throughout our lives?

Amanda: My utopia would be one with no death. I've dealt with so many deaths of family members in the past 4 years. Every time, I feel a little more alone, and a little more like life sucks. People always tell me that good things will happen to good people, and bad things to bad. But my grandpa, grandma and uncle were selfless people who had a hard life. Time and again I would see them in pain, and then in the end I lose them to cancer. Why? I don't understand and I want it to stop. This is my unicorn and rainbow-like utopia.

Anjali: Everyone will keep their front doors open to let in the fresh air. There will be no harsh winters. A little snow is okay for Christmas. When it rains, the clouds shouldn’t be all gloomy, and there will be no pollution or acid rain. Everyone’s house will have a compost bin and a garden. No families will be separated because they are across the border in another country. Everyone should be able to visit other countries without visas. This can be possible if everyone has a good heart.

Nazrin (a young woman in a head scarf): I imagine a world without greed, hunger, thirst, violence, but with subtle pains that make our happy moments even more valuable and precious. I imagine a feeling of love and welcoming no matter who we are or where we go. I imagine a world where numbers don’t define us, and where everyone is free to roam without holding a mask (or several) in front of his or her face. I imagine a world where sicknesses are cured by love and the desire to live.

Here’s my utopia. We will recognize how stupid and wrong war is and end it once and for all. With the money we save from shrinking our armies we will end poverty, too, and come up with inventions that help us thrive without wrecking the rest of nature. And we will keep giving ourselves more freedom, more choices to explore. My children and students and other young people and their children and grandchildren will find new ways to be human, to live good, meaningful lives, ways we can’t even imagine now. Our identity crises, our swerves and explorations and crossings, will never end. No ending is the happiest ending.

Wrap-Up

## So What?

I once pitched story ideas to the editor-in-chief of a science magazine over lunch. After obligatory industry gossip, I served up my best story. Scientists have discovered single neurons that respond to images of famous individuals, like Bill Clinton and Sylvester Stallone.

So what? the editor asked.

Scientists find these cells in a dramatic way, I said. They experiment on epileptics who have had electrodes implanted in their brains to locate the seizures. After getting permission from the epileptics and their families, the researchers insert extra electrodes that can detect signals from single brain cells. They show patients images of their favorite celebrities to see if any individual neurons fire. The researchers will let me watch them experiment on a young, epileptic man who has wires running from his head to recording equipment.

So what? the editor asked.

This research, I said, addresses a huge question, how brain cells represent the world, and it is reviving an old, supposedly discredited idea, the grandmother-cell hypothesis, that specific cells are dedicated to specific things, like your grandma. The research suggests that single cells can do a lot of sophisticated signal processing. Each cell is more like a computer than a simple transistor or switch.

So what? the editor asked, taking another bite of his tuna salad or whatever the hell he was eating.

This story, I said, is a little piece of the mind-body problem, the deepest mystery in science, and if that's not enough for you, I don't know what else to tell you. The editor dabbed his mouth with his napkin and said he'd get back to me. Did I have any other stories?

The editor loved playing this game with writers, to put them in their place. I wanted to say, So what? So you can publish something interesting in your rag for a change, so you don't keep hemorrhaging subscribers and get your ass fired, that's what, Steve.

But Steve was just doing his job. Readers as well as editors are entitled to ask an author, So what? I certainly ask that question when someone sends me a science-y book to review. If I'm in a hurry—and I'm always in a hurry—I skim the introduction and jump to the last chapter to see where the author ends up. It's annoying when the conclusions are so dense and detailed or lyrical and airy-fairy that the point is obscure. As I turn to the final page I think, Give me your punch-line, man! Tell me your point! Now or never!

If you've read the previous chapters, I hope you're not still asking, So what? But maybe you are. Maybe my oblique, case-study approach to my topic left you with unanswered questions. Or maybe you haven't read the book yet, and you've skipped ahead to see where I end up. So in the following Q&A I'll pretend to be an obnoxious, skeptical journalist (not exactly a stretch) interrogating an earnest, obtuse author (ditto) about his new book.

Q: I've read your book, skimmed it, most of it, at least half, and I'm still not sure I get your point. Give me your sound-bite.

A: My book is about the central mystery of existence, the mind-body problem. In a narrow, technical sense, the mind-body problem asks how matter generates mind, but it's really about what we are, can be and should be, individually and as a species. For thousands of years, prophets, poets and philosophers have told us stories about who we really are, but these stories are all over the place, they conflict with each other, and we have no way to decide which one is true, it just comes down to personal preference, or taste. I like Christianity, you're into neo-Platonism. Now science is converging on a definitive, objectively true solution to the mind-body problem, backed up by hard empirical evidence, or so some science enthusiasts claim. I argue that they're wrong. Science has told us a lot about our minds and bodies, but in the end it's just giving us more stories that we choose for subjective reasons, because we find them consoling, or beautiful, or meaningful. Science will never discover an objectively true solution to the mind-body problem, which tells all of us once and for all who we are and should be, because that solution doesn't exist. But…

Q: Isn't this the same pessimistic message you've been peddling for decades?

A: Yes, I mean no, it's…

Q: Even if it’s true, who wants to hear it? It’s depressing.

A: No, it’s not! The message of my new book is exhilarating, and liberating. If science can’t solve the mind-body problem, that means you’re free, I’m free, all of us are free to decide for ourselves who we are and what life means. I’ve never said this before, because I only realized it recently.

Q: Same old product, glossy new wrapping. Explain your title. Why didn’t you just call your book The Mind-Body Problem?

A: Because there are lots of mind-body problems, like consciousness, the self, free will, our sense of right and wrong, the meaning of life. Also we all face our own private version of the mind-body problem, because we all have different minds and bodies and lives, so we have to find our own solutions. You might say there are as many mind-body problems and solutions as there are individuals. Hence, Mind-Body Problems, with an s.

Q: You might say that, I wouldn't. Your definition of the mind-body problem seems awfully baggy. Do experts agree with it?

A: Well, as my book shows, mind-body experts don't agree on much. Some won’t like my definition of the mind-body problem because it mixes is and ought. It lumps questions about what we are and can be with questions about what we should be. But in the real world, is and can and ought are all tangled up with each other, and so are all the parts of the mind-body problem. Science always ends up telling us what we should do, if only implicitly.

Q: Really? Give me examples.

A: Sure. Neuroscience supposedly shows that mental illness is really biochemical and can be successfully treated with drugs, so that’s how it should be seen and treated. Evolutionary biology supposedly shows that males are innately more competitive than females, and better at abstract thinking, so we should accept male domination of math and engineering.

Q: Come on, no scientists say that.

A: Yes they do! Here’s another example. A neuroscientist I interviewed for my book, Christof Koch, says we can enhance our cognitive abilities with brain implants, so that’s what we should do. My point is that when it comes to the mind-body problem, there’s no clear line between is, can and ought. Our ideas about consciousness affect our ideas about the self and free will, which in turn affect how we think about morality and the meaning of life. That’s why I treat the mind-body problem as one big knotty mystery.

Q: So it’s lots of problems, and it’s one problem. Got it. Why didn’t you just lay out your argument in a straightforward way? Why dwell so much on the personal lives of Christof Koch, Alison Gopnik and other experts you interview? You even dig into their sex lives!

A: Right. My claim is that our supposedly rational, objective views of the mind-body problem are invariably affected by subjective factors, by our fears and desires, by what we find beautiful or consoling, and by good and bad things that happen to us. Rather than just state this argument in an abstract way, I thought it would be more interesting, and appropriate, to dramatize it by telling the stories of mind-body experts who’ve undergone some sort of identity crisis. Incredibly, I found nine experts who met this criterion and agreed to talk to me about their private lives. Sex came up in some interviews because it is a fundamental part of our identities. Also, I admit, I am a little nosy. I’m curious how people who think about life for a living cope with life.

Q: Some don't cope that well, from what I’ve read. Are you worried how your subjects are going to react to your book?

A: I’m a little worried. But I disagree that my subjects haven’t coped that well. I think they’ve done extraordinarily well, especially considering what some of them have endured.

Q: That’s nice. But I bet they won’t like you saying that neither they nor anyone else can figure out how the mind works. You’re a mysterian, aren’t you? One of those guys who says science can’t explain the mind?

A: Not really. Mysterians say we can’t solve consciousness, the hard problem. I’m saying there are lots of possible solutions to consciousness and other mind-body mysteries. Experts disagree about which ones are best, and they choose solutions that work for them, that help them make sense of their lives. So non-experts should feel free to do the same. I’m really a pragmatist. Whatever works, works.

Q: You mean, anything goes. What if I’m into young-earth creationism, or patriarchy, or white supremacy, or all the above? Is that cool with you?

A: Look. I have my own beliefs, which I think are conducive to human flourishing and compatible with science. I’d be thrilled if more people shared my views. But my book celebrates human diversity, including diversity of belief and behavior. In my ideal world, you are free to believe

anything you like, and to persuade others to share your beliefs. You just can't force your beliefs on others.

Q: Wait, we already have the freedom you're so generously giving us. In our country you can believe any crazy crap you like and blab about it on Facebook.

A: You're right. An advantage of the system I'm advocating is that it already exists. Liberal democracies like the U.S. give people freedom of belief and speech, and that's as it should be. But we can't take that freedom for granted, because lots of people think we're too free. They think they possess the one, true answer to the mind-body problem, and they want everyone else to accept it, too. I'm not just talking about religious fanatics. Some scientists insist we're nothing but matter, a pack of neurons and genes, and they say you're a fool if you believe in God, souls and free will. This claim is unjustified, it gives science more authority than it deserves. I'm worried about dogmatism in all forms. In the past science has inspired lethal ideologies, like social Darwinism and eugenics and Soviet-style communism. Scientists should be more modest and humble in their claims.

Q: You don't sound very modest or humble when you tell scientists what to do.

A: Yeah, I get that. I once interviewed Karl Popper, who spent his career denouncing dogmatism in science and politics. When I said that some philosophers accused him of being dogmatic, Popper pounded the table and said his critics were wrong! Advocating skepticism can be tricky. Skeptics are always vulnerable to the charge of self-contradiction, and even hypocrisy. I like to think of my skeptical stance as a paradox, not a contradiction.

Q: I'm skeptical of your skepticism. Look how fast neuroscience and genetics have been advancing lately. A solution to the mind-body problem could be right around the corner.

A: At some point neuroscience and genetics might have a big payoff, like better treatments for mental illness. But physiological theories can't solve the problems of consciousness, or free will, they can't solve our ethical dilemmas, or tell us what makes life worth living. Ideally, this research, rather than converging on a single solution to the mind-body problem, will give us more solutions, more options, more ways to see ourselves and be ourselves.

Q: What about artificial intelligence, and the Singularity? Aren't we

all about to turn into cyborgs? Maybe then we'll be smart enough to figure ourselves out.

A: AI is prone to boom-bust cycles. Right now it's going through a boom, which is generating tremendous hype. I'm not worried about humans fusing with machines, or machines taking over the world. I am worried about wealthy, powerful humans using machines to gain even more wealth and power and diminish the freedom of the rest of us. I'm hoping our democracy is up to that challenge.

Q: Isn't it possible that someday a genius will come along who can solve the mind-body problem?

A: I call this the myth of the scientific savior. I can imagine, all too easily, some charismatic figure, a unholy hybrid of Buddha, Marx, Darwin, Freud, Einstein and L. Ron Hubbard, convincing us that he—it will almost certainly be a he, because we prefer saviors with penises—he has solved the mind-body problem. He knows who we really are and should be. Intellectuals will hail this event as the culmination of the Enlightenment, but actually it will be the opposite, it will be the beginning of a new dark age, because it will mean that our desire for certainty has extinguished our doubt and creativity and desire for freedom. All messiahs are false messiahs.

Q: Okay, calm down. Let's say I buy your argument about the mind-body problem. So what? Why does it matter?

A: Great question. Let's imagine, as an admittedly far-fetched thought experiment, that everyone reads my book and finds my argument persuasive. How will things change? First of all, scientists and non-scientists alike would give up the idea that there is one true way to see ourselves, and be ourselves. You might like psychedelic quantum anarchy, or Darwinian Buddhism, or a Christianized version of transhumanism, but you don't insist that everyone shares your preference, because you accept that it is based on taste as much as truth. We all become more tolerant of each other, and more compassionate and kind, because we realize that life is hard for everyone, everyone is struggling to make sense of it, to find a little happiness. Also, when we weigh which way to go collectively, as a species, we will choose paths that give us more choices, more ways to live, to explore and create ourselves. And finally, everyone will see how weird our existence is, and how inadequate language is for explaining it. We are infinitely improbable, there is no reason for us to be here, and yet here we are. If you're religious, or even if you're not, you

might call our existence a miracle, for which we should be profoundly grateful. So if everyone reads my book and agrees with it, humanity will be more free, kind, peaceful and happy.

Q: What were you saying before about messiahs?

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This book, to be honest, feels incomplete. I keep thinking of Douglas Hofstadter's comparison of his ideas to shells he discovers while strolling along the beach of Platonic forms. He unburies them and brushes the sand off them so he, and we, can appreciate them. Pardon the grandiosity, but I feel as though I have brushed the sand off the tip of a structure that remains largely buried, like an ancient obelisk inscribed with runes.

My own life, as much as anything, convinces me that science cannot pin us down. At 20 I was living in a pup tent in a mangrove swamp in the Florida Keys, eating coconuts, conch and windowpane. At 40 I was a full-time staff writer for Scientific American, married, with a newborn son, commuting to New York City from a hamlet north of New York City. Now I am divorced, with a grown son and daughter. I live alone and teach at a school in Hoboken, New Jersey.

Rebecca Goldstein, or her alter ego Renee Feuer, created the mattering map to emphasize all the different things that make life worth living for different people. You can make the same point by looking at a single life, or even a single day in a single life. Here are things I did that mattered to me on a recent day. Lie in bed beside Emily while she raves about a novel whose heroine falls in love with a sweet, sexy merman. Talk to my daughter over the phone about her plan to fly to Finland to get the hell out of this crazy country. Listen to my students argue about whether college is helping them escape the cave or pushing them deeper inside, and whether knowing you're in the cave is sort of like escaping.

To be human means to shape-shift, to swerve, to cross in ways small and big, on scales long and short. Right now, as you read these words, your brain is re-wiring itself. Synapses are strengthening and weakening, dissolving and reforming. When I think about neuroplasticity, I envision my

brain as a mass of squirming worms. No wonder Buddha and Douglas Hofstadter say the self is an illusion. This book was crowd-sourced. And yet. Something within us endures in spite of our never-ending changes.

When I was a child, I wrote stories about people fleeing dinosaurs. I'm still writing stories. My writing self has gradually subsumed my other selves, which means I'm always meta, standing a little apart from myself and others, and that's okay. Writing works for me. Writing didn't resolve my life-long identity crisis, it monetized it. As I finished this book my father had a stroke. He struggles to speak and understand others, he gets frustrated, but he is still the same cheerful, indomitable, loving man, he is still my father.

There is no essence and there is. Each of us is unique and a synecdoche for all. We're all in this together, we're all alone. Like super-heated plasmas, we squirt out of every bottle we construct to contain ourselves. Not even a single person can be captured by a single mind-body story, let alone all humanity. Every story, no matter how compelling, misses something. And yet we need stories to escape the prison of ourselves, to see the world through others' eyes, however dimly.

You have many stories from which to choose. Perhaps you're in the mood for a novel about a young, female philosopher obsessed with the mind-body problem. You might prefer a nonfiction treatise that depicts babies as mini-Platos deducing the world, or that explains our best and worst impulses with evolutionary biology and game theory. Maybe you'd like a memoir that transports you into the mind of a law student suffering a psychotic breakdown, or a middle-aged male economist who realizes he is a woman.

You might go with an oldie but goody, like Portrait of a Lady or Varieties of Religious Experience. The story could be a sculpture, a giant marionette being jerked around by chains to the soundtrack of When a Man Loves a Woman. It could be an implanted optogenetic array that triggers feelings of mystical oneness by stimulating your temporal lobe while simultaneously generating a real-time, three-dimensional, virtual-reality simulation of your brain so you can swoop through the illuminated neural circuits underpinning your self-transcendence. The story could be a technical and legal argument that neural implants should be banned because they will always be vulnerable to hackers, including those working for governments and corporations.

The story could be a work of journalism about men and women who

are obsessed with the mind-body problem and try to explain it in different ways, which reflect their temperaments, tastes and troubles. The book's premise would be that no one can tell you who you really are, you have to figure that out for yourself, and there isn't one story of humanity, there are multitudes of stories, which can be told in all the ways above and others yet to be imagined.

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It was the last day of the 2016 "Science of Consciousness" conference in Tucson. I had already done what I came to do. I had interviewed Alison Gopnik and Stuart Kauffman and listened to their public lectures. I had taken notes on other talks about consciousness, and given my own talk. As the day wore on, my mood and energy flagged. I perked up for a lecture in the cavernous Kiva Ballroom by Robin Carhart-Harris, who talked about "Brain Imaging Studies with Psychedelics." He seemed perfectly cast for the role of psychedelic investigator. Young, bearded, British, earnest, trained in psychoanalysis.

LSD and psilocybin, which resemble our natural neurotransmitters, are powerful tools for exploring the conscious and unconscious mind, Carhart-Harris said. He gives these drugs to subjects and records their subjective impressions while scanning their brains with fMRI and other imaging methods. Psychedelics boost crosstalk between different neural regions, and as this "global integration" increases, so does "ego dissolution," often accompanied by bliss. Our sense of ourselves as distinct individuals, separate from the rest of the world, diminishes. Our sense of "oneness," Freud's "oceanic feeling," grows.

Echoing Gopnik, who spoke before him, Carhart-Harris conjectured that psychedelics return us to childhood, before our frontal cortices, belief systems and egos have congealed. He quoted Wordsworth: "Heaven lies all about us in our infancy!/Shades of the prison house begin to close upon the growing boy." I found Carhart-Harris's lecture intriguing but dispiriting. I am in the prison house. I can't see the splendor in the grass, the glory in the flower.

I also had a split reaction to the lecture of an Asian neuroscientist, Jimo Borjigin, doing research on near-death experiences. Why do people often experience extravagant, heavenly visions during near-death experiences? What's going on in their brains? Borjigin can't experiment on dying humans, so she poisons and asphyxiates rats. Dying rats' brains show a surge of neural activity and dimethyltryptamine, a psychedelic that occurs naturally in trace amounts in the brain. Part of me was impressed with her findings, which corroborate speculation that DMT plays a role in near-death experiences. Another part felt sorry for the rats, sacrificed to satisfy humans' craving for self-knowledge.

My mood sank further during a physiologist's lecture on a French guru who emits some kind of mystical light. Cameras can't detect the light, but the physiologist and others who sit in his presence can. The light emanating from the guru can be white or colored. It becomes brighter in a brightly lit room and fainter in a dark room. It is attenuated by double-glazed glass…

I walked out halfway through the talk. I sat in the lobby of the conference resort, notebook in my lap, contemplating the infinitude of human folly. I was wiped out, mentally and physically. I was ready to skip the "End-of-Consciousness Party" that night and hole up in my hotel room. I would eat a room-service burger and watch vintage Star Trek episodes on my laptop.

Then two young philosophers I knew slightly, male and female, strolled by and asked if I would like to join them for dinner. I said sure. We ended up at a crowded, raucous table with several other youngish mind-explorers and a white-haired psychologist. I ranted to my fellow geezer about my encounter with two guys who claimed they could bend spoons telekinetically. The psychologist said he once bent a spoon. He seemed like a genial, intelligent fellow, so I decided to believe him, or to believe that he believed. I remained unfazed even when he confessed that he believed in astrology. Life is hard, I thought, we're all entitled to a woo belief or two.

After dinner, I headed with a few tablemates back to the Kiva Ballroom for the "End-of-Consciousness Party." I sat at a table beside the dance floor with the two young philosophers who had invited me to dinner. We talked about psychedelics, mysticism and God. One confessed her suspicion, inspired by Hindu theology, that God creates the world because he gets bored and lonely. I told her I had the same suspicion. As often happens

when I talk to young people, I started feeling better about humanity's future.

The ballroom was packed when a lithe woman in a white suit with bare midriff and long platinum hair strode onto the stage trailed by four guys in white turtlenecks. Dorian Electra and the Electrodes, our evening's entertainment. As Dorian took command of center stage, one Electrode planted himself behind a drum set and another behind a keyboard, and two strapped on guitars.

Dorian spotted Stuart Hameroff, who has been organizing these conferences and plugging his quantum-consciousness theories since 1994. Dorian pointed a long, thin finger at Hameroff and yelled, "Stuart, I solved the mind-body problem, so you don't have to have this conference any more!" Guitars, drums and keyboard pounded, and Dorian growled:

Got my mind on your body and your body on my mind.
It's a mind-body problem will we solve it in time?
And everybody thinks that you're fine. But I know there's a problem, press your body to mine.
Ooo Oo
Press your body to mine
Ooo Oo
Press your body to mine
I don't know nothin' bout the heart and the soul
The mind and body and what we control
And can't help it well my mind knows it true
My body's calling when I'm next to you

She was a caterwauling witch, undulating across the stage, snarling, shrieking, purring. People swarmed onto the dance floor wriggling and writhing. The song over, Dorian shouted, "That's all you need to know, people! Hard problem? It's solved!"

She started singing White Rabbit, slow at first, then faster and faster. The crowd went nuts as a giant white rabbit strolled across the dance floor. Then Dorian was moaning, "This world, unreal, just like a simulated fantasy…. Brain in a vat, I'm just a brain in a vat," and the dancers parted for a guy in a white lab coat wheeling a table with three brains in jars.

Dorian spotted David Chalmers and yelled at him to sing a song. Chalmers, looking groovy as usual in black jeans and jacket, jumped up on the stage and bellowed into a mike. Other than the phrase "quantum

computers," I couldn't understand him, and that was okay, his message was clear, he is an animal, we're all animals, we're bodies, let's not forget that when we're agonizing over the damn mind-body problem.

Mind-body explorers old and young were boogying now, my two young philosopher friends, and Chalmers and Hameroff with their mates, and Stuart Kauffman, shaking it with his wife and beaming, no sign of sorrow on his noble, weathered face. They haven't achieved full ego dissolution, collective consciousness, they haven't escaped the prison of their minds, they have just forgotten they are in the prison, they are having fun, and that's sort of like escaping, and as I watched these seekers gyrating and grimacing, affection for them washed over me, washed away all my sadness and doubt, and I felt the borders of my prison cell wobbling. I thought, Yeah, man, consciousness, what a trip. Maybe science and philosophy can't solve the mind-body problem, but rock 'n roll can.

Or so I wrote in my notebook.